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ABSTRACT

Research on increasing teacher effectiveness is presented in this book. Chapter 1 outlines a framework for investigating and understanding teacher effectiveness, with attention to the following components: teacher and student characteristics; curriculum; classroom environment and management; teaching; and learning. Chapter 2 describes the two variables that are linked to student learning--opportunity to learn and academic work. Policies concerning these two variables lay the groundwork for increasing teacher effectiveness. Chapter 3 examines ways to create physically and psychologically appealing classrooms, and chapter 4 presents ways in which these classrooms can be organized to promote effective teaching and learning. Chapters 5 and 6 describe ways in which effective teachers structure their lessons and communicate with their students. Student learning as both a process of involvement and an outcome (success) is discussed in the seventh chapter. The final chapter offers strategies for increasing teacher effectiveness--overcoming reluctance to change and providing support for improvement efforts--and makes recommendations for policymakers and educational planners. One figure and one table are included. Appendices contain sample teacher evaluation instruments. (Contains 99 references.) (LMI)

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Increasing teacher effectiveness

Lorin W. Anderson

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Increasing teacher effectiveness

Lorin W. Anderson

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Foreword

The booklets in this series are written primarily for two types of clientèle: those engaged in educational planning and administration, in developing as well as developed countries; and others, less specialized, such as senior government officials and policy-makers who seek a more general understanding of educational planning and of how it is related to overall national development. They are intended to be of use either for private study or in formal training programmes.

Since this series was launched in 1967 practices and concepts of educational planning have undergone substantial change. Many of the assumptions which underlay earlier attempts to rationalize the process of educational development have been criticized or abandoned. If rigid mandatory centralised planning has now clearly proven to be inappropriate however, all forms of planning have not been banished. On the contrary the need for collecting data, evaluating the efficiency of existing programmes, undertaking a wide range of studies, exploring the future and fostering broad debate on these bases to guide educational policy- and decision-making has become even more acute than before.

The scope of educational planning has been broadened. In addition to the formal system of education, it is now applied to all other important educational efforts in non-formal settings. Attention to the growth and expansion of educational systems is being complemented and sometimes even replaced by a growing concern for the quality of the entire educational process and for the control of its results. Finally, planners and administrators have become more and more aware of the importance of implementation strategies and of the role of different regulatory mechanisms in this respect: the choice of financing methods, the examination and certification procedures or various other

regulation and incentive structures. The concern of planners is twofold: to reach a better understanding of the validity of education in its own empirically observed specific dimensions and to help in defining appropriate strategies for change.

The purposes of these booklets include monitoring the evolution and change in educational policies and their effect upon educational planning requirements; highlighting current issues of educational planning and analyzing them in the context of their historical and societal setting; and disseminating methodologies of planning which can be applied in the context of both the developed and the developing countries.

In order to help the Institute identify the real up-to-date issues in educational planning and policy-making in different parts of the world, an Editorial Board has been appointed composed of two general editors and five associate editors from different regions, all professionals of high repute in their field. At the first meeting of this new Editorial Board in January 1990, its members identified key topics to be covered in the coming issues, under the following headings:

1. Education and development.
2. Equity.
3. Quality of education.
4. Structure, administration and management of education.
5. Curriculum.
6. Cost and financing of education.
7. Planning techniques and approaches.
8. Information systems, monitoring and evaluation,

One or two associate editors correspond to each heading.

The series has been carefully planned but no attempt has been made to avoid differences or even contradictions in the views expressed by the authors. The Institute itself does not wish to impose any official doctrine. Thus, while the views are the responsibility of the authors and may not always be shared by UNESCO or the IIEP, they warrant attention in the international forum of ideas. Indeed, one of the purposes of this series is to reflect a diversity of experience and opinions by giving different

authors from a wide range of backgrounds and disciplines the opportunity to express their views on changing theories and practices in educational planning.

Aware of the concern of many planners and policy-makers all over the world for a better quality of education, as well as of the central, if not unique, role of teachers in the transmission of knowledge, the Editorial Board requested Professor Lorin Anderson of the University of South Carolina, to prepare this booklet on "Increasing Teacher Effectiveness". He synthesizes a mass of existing research results on teacher effectiveness in a particularly easy and clear way. He also suggests how this knowledge could be used to increase the effectiveness. This booklet is thus valuable reading for all those planners, researchers and teachers concerned with increasing the quality of education.

The Institute would like to thank Professor T. Neville Postlethwaite, co-general editor and special editor of this issue, for the active role he played in its preparation.

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Preface

This booklet in the 'Fundamentals of Educational Planning' series is somewhat different from any of the others; it summarizes what is known from published research about *Increasing teacher effectiveness*.

Teacher salaries account for 70 to 90 per cent of the recurrent educational budget. It is through teachers and teaching that, to a large extent, the learning process is organized. In many countries a great deal of money has been invested in trying to discover the characteristics and activities of a 'good' or 'effective' teacher. However, teachers work within schools with certain structures and curricula. The teacher plans the environment of the classroom, organizes and manages the class, determines the detailed content, and its sequencing and pacing, the overall structure of the lessons, the homework, the feedback mechanisms to know how each pupil is 'getting on' and the correctives to be taken. Some teachers plan and execute all of these things better than others. But, what is it -- in particular -- that makes an effective teacher?

In planning the quality of education, it is clear that teachers are probably the most important component of the educative process. As Anderson points out in Chapter I there are, of course, other inputs to schooling which affect learning outcomes. In this booklet the implications are for those responsible for planning the pre-service and in-service training of teachers in the national and provincial countries or departments of education. Where systems of education also have national, provincial or district inspectors there are implications for what they can do to help to improve teachers effectiveness. There are also implications for curriculum planners, educational administrators, and for planners responsible for equipping schools and classrooms.

The author has also provided, in the Appendices, a set of short instruments which can be used by those responsible for the

planning of teaching, as well as for teachers, to help them in their work.

For nearly three decades, Dr. Lorin Anderson of the University of South Carolina in the United States of America has been deeply involved in research on teaching in the USA and other countries, including several developing countries. The Editorial Board of the IIEP 'Fundamentals in Education' series was delighted when Dr. Anderson agreed to prepare this booklet on *Increasing teacher effectiveness*.

As educational planning begins to alter its emphasis from planning the *quantity* of education to planning the *quality* of education, it is themes such as *Increasing teacher effectiveness* which emerge as a new focus for educational planning. It is with this in mind, I am sure, that all readers will benefit from the excellent summary that is presented about the current state of knowledge concerning teacher effectiveness.

T. Neville Postlethwaite
Co-general Editor

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I. A framework for investigating and understanding teacher effectiveness

Over the past thirty years, developing countries have made great strides in achieving the goal of universal primary education. In 1985, more than three-fourths of primary age children attended school in the vast majority of these countries, an average increase in enrolment of approximately 10 to 15 per cent since 1970 (Lockheed and Verspoor 1991). At the same time, however, only a relatively small proportion of those children who begin primary school complete it. Dropout rates of more than 50 per cent between first and sixth grade (the typical ending point of primary education) are not uncommon (Lockheed and Verspoor 1991). The challenge facing educators in these countries in the next decade and beyond, then, is how to improve the quality of the education these children receive.

There are several ways in which the quality of an education system can be improved (Fuller 1986). School expenditures can be increased. School and classroom organization can be changed. More and better instructional materials can be provided to students. The quality of teacher preparation and initial training can be improved. There is increasing evidence that changes in many of these so-called 'schooling factors' have profound effects on the learning of children in developing countries (Avalos and Haddad 1981; Cohn and Rossmiller 1987). In fact, these effects are likely to be stronger in these countries than they are in developed or industrialized countries (Farrell 1989).

During the past decade, however, educators increasingly have come to realize that any meaningful improvement in the quality of

education that students receive is highly dependent on the quality of the instruction that teachers provide. In slightly different terms, educational effectiveness depends to a great extent on teacher effectiveness. At least two reasons can be given for this emphasis on the teacher. First, teacher salaries represent a substantial portion of the total funds allocated to education in most countries; in developing countries, teacher salaries account for between 75 and 95 per cent of the total education budget. Second, there is an increasing awareness that teachers have absolute veto power over innovation and change even in the most highly centralized systems of education. For example, teachers must endorse and actually use new instructional materials before the materials themselves can have any impact on students. Without teacher endorsement, the best designed materials can end up on shelves or in closets.

In order to substantially improve the quality of education that students receive, then, we must study what happens in the classrooms in which they receive their education. We need to know what portions of the curriculum actually find their way into the classroom. We need to know what teachers say when they explain a difficult concept to students. We need to know the activities that teachers use to involve their students in learning. In Bloom's (1972) terms, we must begin to examine what teachers *do*, not what teachers *are*. Avalos and Haddad (1981), at the end of the research review, elaborate on this important point:

> "The obvious conclusion ... is that to some extent at least, a different type of research is needed. Macro studies of the effects of the educational system that follow the pattern of the input-output probably are not adequate and cannot yield more information than what already exists. Insights into the teaching process and the interaction of its variables can probably best be gained by ... observational techniques. On the basis of this information gathered in a variety of contexts it might be possible to suggest actions (in teaching and training) to be experimented with and evaluated". (p. 61)

Since the publication of the Avalos and Haddad volume, numerous observational studies of classrooms have been conducted in the United States (see Brophy and Good 1986; Doyle, 1986; and Rosenshine and Stevens 1986 for reviews) and the United Kingdom (Galton 1987), and some developing countries (Namuddu 1989). In addition, in the mid-1980s a major international study of classrooms was conducted in nine countries located on five continents (Anderson, Ryan, and Shapiro 1989). The results of these studies suggest that classroom teaching is largely the same throughout the world. Anderson (1987a) summarizes the results of the international study in the following manner:

> "... three primary types of activities occurred to a greater or lesser extent in the classrooms in all participating countries. Teachers talk "at" or "with" their students ...; students work on assignments at the desks or at laboratory tables ...; and teachers engage in a set of general classroom management activities such as taking attendance or distributing and collecting papers". (p. 82)

The results of these studies also suggest that certain classroom variables are moderately, yet consistently, associated with student classroom behaviour and student achievement. For example, teachers who provide structure for their students (e.g., by informing students of what they are to learn and how they are to learn it) are likely to have students who spend more time involved in learning and who, ultimately, learn more. Similarly, teachers who regularly monitor and supervise their students' learning (e.g., by checking student work and helping individual students overcome errors and learning difficulties) are likely to have students who exhibit higher levels of achievement.

While these studies are promising, they do not provide (and, in fact, cannot provide) clear cut prescriptions for increasing teacher effectiveness, particularly in developing countries. Unfortunately, the vast amount of research on teacher effectiveness has been conducted in Western countries where teachers tend to hold college and university degrees. However,

these studies can provide educators with important concepts that can be used to investigate and understand teacher effectiveness; concepts such as structuring and monitoring. As shown in the Djalil and Anderson (1989) and Nitsaisook and Anderson (1989) studies, many of the concepts derived from research conducted in Western countries are clearly applicable to understanding and ultimately improving the effectiveness of teachers in developing countries.

The material contained in this booklet is consistent with two important outcomes of recent classroom research: key concepts that help us understand teacher effectiveness and 'experimental actions' that guide our attempts to improve it. In each chapter, major concepts and related principles associated with teacher effectiveness are presented and discussed. These concepts and principles are intended to enable policy-makers and practitioners to develop a common way of viewing problems and issues associated with improving the quality of education provided to students and a common language for talking about and working toward the solution of these problems and issues.

In addition, instruments that can be used to monitor and evaluate attempts to systematically change and improve the quality of instruction provided to students are included as Appendices. Data obtained from these instruments can be used by policy-makers and practitioners to make decisions as to the effectiveness of particular 'experimental actions' and to suggest additional changes that may be needed for improvement in teaching and learning to occur and be sustained.

1. What is an effective teacher?

Effective teachers are those who achieve the goals they set for themselves or have set for them by others (e.g., school administrators, ministries of education). As a consequence, those who study and attempt to improve the effectiveness of teachers must be cognizant of the goals imposed on teachers, the goals that teachers establish for themselves, or both.

A corollary of this definition is that effective teachers must possess the knowledge and skills needed to attain the goals and

must be able to use that knowledge and those skills appropriately if the goals are to be achieved. In Medley's (1982) terms, the *possession* of knowledge and skills falls under the rubric of *teacher competence*. In contrast, the *use* of knowledge and skills in the classroom is referred to as *teacher performance*. Thus, those who investigate and attempt to understand teacher effectiveness must be able to link teacher competence and teacher performance with the accomplishment of teacher goals (that is, teacher effectiveness).

Several assumptions are implicit in this definition of teacher effectiveness. An initial assumption is that effective teachers tend to be aware of and actively pursue goals. These goals guide their planning as well as their behaviours and interactions in the classroom. This assumption does not mean that effective teachers are always aware of goals; in fact, awareness is particularly likely to be lacking when goals have been established for teachers by others. Nor does this assumption mean that everything teachers think about or do is related to the attainment of some goal. Teachers, like the rest of us, often do things just to do them. Rather, the assumption means that effective teachers *tend to be* purposeful and goal-oriented.

A second assumption is that the vast majority of teachers' goals are or should be concerned either directly or indirectly with the learning of their students. An example of direct teacher concern with learning is a teacher who states that he or she intends to help students develop the ability to differentiate facts from opinions. In contrast, an example of indirect teacher concern with learning is a teacher who sets out to decrease the level of disruptive behaviour in the classroom because the teacher believes that minimizing or eliminating disruptive behaviour is necessary before learning can occur. It should be obvious that if teachers' goals are stated in terms of their students' learning, then, as Medley (1982) asserts, "teacher effectiveness must be defined, and can only be assessed, in terms of behaviours and learning of students, not behaviours of teachers" (p. 1894). Also, in this regard, the World Bank (1990) suggests that "countries must emphasize students' *learning* as the key policy objective" (p. 54).

A third assumption is that no teacher is effective all the time. An elementary school teacher may be highly successful teaching reading comprehension to his or her students, while struggling to teach them the elements of rudimentary problem solving in mathematics. A secondary school teacher of literature may be quite able to teach students an appreciation of poetry, but have some difficulty teaching them how to interpret the symbolism in a series of novels. Thus, the degree to which a given teacher is effective depends to a certain extent on the goals being pursued by that teacher (Porter and Brophy 1988).

Similarly, an elementary school teacher may be truly excellent with students with lower academic aptitudes, while at the same time feeling quite frustrated with his or her inability to 'reach' those students with higher academic aptitudes. A secondary school mathematics teacher may be particularly adept with students who are well motivated to learn mathematics, but have great difficulty with those who wonder why they have to learn mathematics in the first place. Thus, the degree to which a teacher is effective also depends to a large extent on the students being taught by the teacher.

Despite the apparent validity of these examples, it seems reasonable to assume that those we term 'effective teachers' are effective more often than not. In other words, there is some degree of consistency in these teachers' effectiveness over classroom conditions and over time. As we shall see throughout this booklet, however, this effectiveness does not stem from the rigid adherence to a standard set of behaviours and strategies in all situations. Rather, teachers who are consistently effective are those who are able to adapt their knowledge and skills to the demands of a variety of situations so as to achieve their goals. Doing whatever is necessary in order to achieve these goals, rather than behaving in certain ways or using certain techniques or methods, is the hallmark of effective teachers.

In summary, then, an effective teacher is one who quite consistently achieves goals which either directly or indirectly focus on the learning of their students. Now that teacher effectiveness has been defined, we can move to a discussion of a

related question, "What factors contribute to teacher effectiveness?"

2. *What factors contribute to teacher effectiveness?*

While defining an effective teacher is reasonably straightforward, identifying those factors which are related or contribute to teacher effectiveness is far more difficult. There are at least two major reasons for this difficulty.

First, teachers and the instruction they provide students are only two of a complex of factors that impact on student learning. One of the fundamental truths in education is that the knowledge, skills, aptitudes, attitudes, and values with which students leave school or a particular teacher's classroom are influenced to a great degree by the knowledge, skills, aptitudes, attitudes, and values the students possess when they enter the school or the classroom. In addition, the knowledge, skills, aptitudes, attitudes, and values students possess upon entry are the result of some intricate and complex combination of their genetic composition and their home background. To complicate matters further, early differences among children are often magnified by their parents' decisions concerning the schools the children will attend and teachers' and parents' decisions as to the programmes within these schools in which they will be placed. As we investigate and attempt to understand teacher effectiveness, then, we must take into consideration not only where the students are going (as determined, in part, by the goals of the teacher), but also where they have been (as determined in part by their genetic composition, their home backgrounds, and their prior schooling experiences).

Second, not only does the effectiveness of a particular teacher depend to a greater or lesser extent on the goals being pursued and the students being taught, but teachers themselves differ. Like their students, teachers differ in terms of the knowledge, skills, aptitudes, attitudes, and values they bring to their classrooms. They also differ in their teaching experience. There is increasing evidence, for example, that novice American teachers differ greatly from more experienced American teachers on a wide

variety of characteristics (e.g., their emphasis on self preservation and classroom management, the inflexibility of their behaviour in the classroom) (Anderson and Burns 1989). As a consequence of these differences both within teachers and across teachers, developing a general list of factors that are guaranteed to be related to teacher effectiveness for all or even most teachers is difficult, if not impossible.

At this point in the discussion, some educators and policy-makers may throw up their hands and suggest that attempts to improve teacher effectiveness are therefore futile. After all, if the genetic composition, home background, and prior school experiences of students account for more than the schools students attend and the teachers they encounter, and if a standard set of behaviours, techniques, and practices associated with effective teaching for all teachers cannot be identified, then why bother to inquire about increasing teacher effectiveness? The counter argument (and the argument underlying this booklet) is threefold.

First, when looked at over extended periods of time (that is, time periods longer than a single month, term, or year), schools and teachers *can and do have* a tremendous impact on the learning of their students. One of the most obvious impacts of schooling on student learning over the long haul is the dramatic increase in differences in student learning as evidenced by standardized test scores. We need to understand what it is about differences in school and teacher effectiveness that produces such remarkable *differences* in student learning.

Second, there is ample anecdotal evidence that individual teachers have profound influences on individual students. Most people can think back to their school days and recall one or more teachers who made a real difference in their lives. Because of this one teacher, a complex idea was understood, a special interest in a particular subject matter was developed, or a desire to pursue a certain career was cultivated. To the extent that these learnings represent goals of the teacher, an external agency, or the student, there can be no doubt that these teachers were effective. We need to understand what it is about such teachers that make them effective.

Third, whether schools and teachers *do have* an impact on student learning depends not only on teachers possessing the knowledge and skills needed to facilitate student learning, but also on their knowing when to use that knowledge and those skills to achieve their student-oriented goals. In this regard, the cards may be stacked against effectiveness. That is, there may be far more ways for teachers to be ineffective than to be effective. The point to be made here, however, is simple. The fact that some teachers do not possess the necessary knowledge and skills, do not know when to use that knowledge and those skills, or are not student-oriented does not undermine the *concept* of teacher effectiveness. Rather, these deficiencies simply make the job of increasing teacher effectiveness more difficult. We need to understand how teachers and the schools in which they work can be made increasingly effective.

3. *A conceptual framework for studying and improving teacher effectiveness and the organization of this booklet*

In order to understand the organization of and the information presented in the following chapters, one must understand the conceptual framework used in preparing this booklet.

As shown in *Figure 1*, the conceptual framework includes six components as well as the interrelationships among these components. Two of these components, teacher characteristics and student characteristics, are *'givens'* in most schools. Students enrol in schools based on established attendance zones or enrolled in the schools by their parents. Teachers are employed in schools, typically for fairly extended periods of time. As a consequence, neither of these components are amenable to great change in relatively short periods of time. In Bloom's (1981) terms, neither is an 'alterable variable.' Nevertheless, as mentioned earlier, the characteristics of both teachers and students are important to consider as we examine and seek to understand teacher effectiveness.

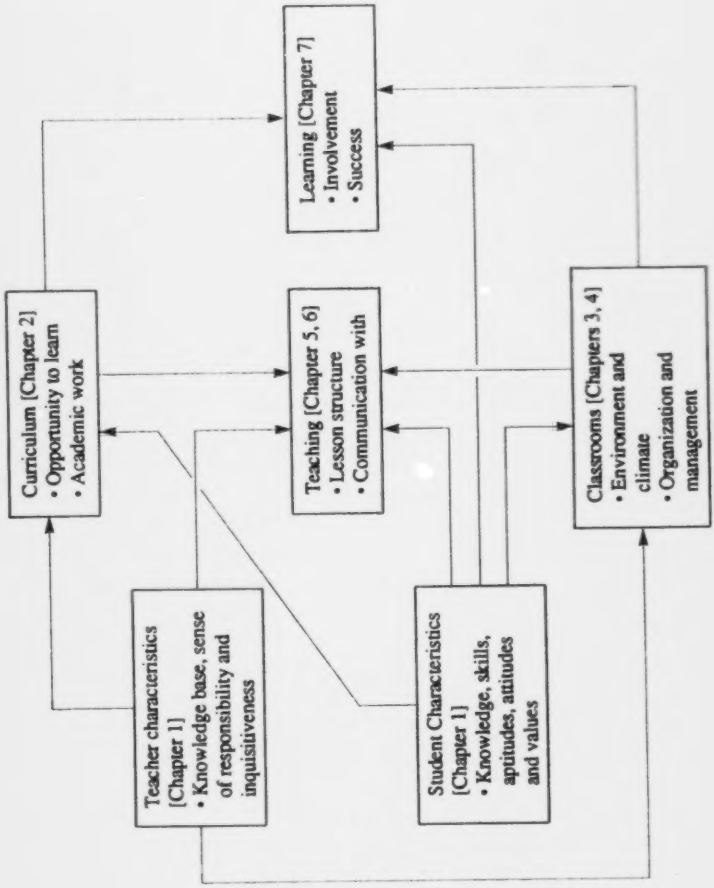

Figure 1. A conceptual framework for studying and improving teacher effectiveness

The three components in the middle column of *Figure 1*, on the other hand, are clearly alterable. As a consequence, changes in these components can be expected to result in changes and improvements in student learning. As a further consequence, policies concerning these components are quite likely to result in increases or decreases in teacher effectiveness.

The top component, curriculum, includes two variables consistently linked with student learning: opportunity to learn and academic work. Even in the most centralized systems of education, large variation in these two variables has been documented (Anderson, Ryan, and Shapiro 1989). As a consequence, as will be seen in Chapter II, policies concerning opportunity to learn and student tasks lay the groundwork for increased teacher effectiveness.

The bottom component in the middle column, classrooms, is clearly manipulable. Teachers set the tone for their classrooms. The rules and routines that are established and enforced in classrooms impact on student behaviour. As will be seen in Chapters III and IV, effective teachers differ from other teachers in the ways in which they 'set up' their classrooms.

The middle component in the middle column, teaching, consists of the ways in which teachers structure the lessons and the ways in which teachers communicate with their students. As will be discussed in Chapters V and VI, more and less effective teachers can be differentiated in terms of both their lesson structure and their communication with students.

The final component included in *Figure 1* is student learning. This component includes student learning as both a process and as an outcome. As a process, student learning is the degree of involvement of students in their own learning (Chapter VII). As an outcome, student learning is the students' successful achievement of specified goals and objectives. This outcome can be referred to simply as 'student success.'

In *Figure 1*, the arrows indicate the direction of the expected influences among the components included in the model. Two types of influence are evident: direct and indirect. Arrows connecting adjacent components indicate hypothesized direct influences of one component on the other. For example, student

learning is believed to be *directly* influenced by curriculum, teaching, classrooms, and student characteristics. These are the four components with arrows directly linked to student learning. Note that the remaining component, teacher characteristics, is *not* believed to directly influence student learning since there is no arrow directly linking these two components of the model. On the other hand, teacher characteristics are believed to directly influence curriculum, teaching, and classrooms, which in turn are expected to directly influence student learning. Thus, teacher characteristics can be expected to have an *indirect* influence on student learning.

The model displayed in *Figure 1* is intended to be heuristic rather than comprehensive. There are several components that could be included in a more comprehensive model. Examples mentioned earlier in this chapter could include school organization and administration, policies governing student placement and evaluation, and instructional support materials (e.g., textbooks, audio-visual materials). The emphasis in this booklet, however, is on teacher effectiveness and while such components may constrain teachers, thus making it more difficult for them to be effective, they do not by themselves guarantee teacher effectiveness. In this regard, they are similar to the components of 'teacher characteristics' and 'student characteristics.' The heart of any conceptual framework that is developed for the purpose of understanding and improving teacher effectiveness consists of the four primary components that are the focal point of this booklet: curriculum, classrooms, teaching, and learning.

4. *A closing comment for policy-makers and educational planners*

The chapters of this booklet are related to the components of the conceptual framework described in the previous section. The precise relationship of each chapter to one of the components of the framework is indicated in *Figure 1* by a bracket.

In each chapter the basic concepts and principles associated with teacher effectiveness are described and illustrated. Each chapter also includes an initial set of recommendations for increasing teacher effectiveness. These recommendations concern

what teachers should know and be able to do if they are to be effective in their classrooms. Each chapter concludes with a second set of recommendations. This second set of recommendations is addressed to policy-makers and educational planners at the local and national levels and concerns what these two groups can do to establish the conditions and provide the resources needed for teachers to be increasingly effective. Instruments that can be used to collect data on curriculum implementation, classroom organization and management, teaching, and student involvement in learning are included as appendixes. By understanding the basic concept and principles, and collecting data on current teaching practices, policy-makers, educational planners, and teachers themselves are in a much stronger position to make decisions that will ultimately increase teacher effectiveness.

II. Opportunity to learn and academic work

Although the term 'curriculum' can be defined in many different ways (Zumwalt 1989), there are several elements which are common to virtually all definitions. The curriculum contains goals and objectives, subject matter and content, and materials (such as textbooks, films and filmstrips, and computer software). The curriculum also includes planned learning experiences through which students are expected to achieve the goals and objectives in and across subject matters using the available materials.

In some countries, teachers have little if any control over goals and objectives, subject matter and content, and materials. In most countries, however, teachers have much greater control over the learning experiences they plan for their students (Anderson, Ryan, and Shapiro 1989). Thus, differences in the learning experiences *planned* by teachers, given the goals, related content, available materials, and their students, may contribute to differences in their effectiveness (Clark and Peterson 1986).

While the consideration of differences in teacher planning are essential as we search for factors contributing to teacher effectiveness, plans, as we all know, may not be actualized. As (Berliner 1988) suggested, an effective teacher is not only someone who plans well, but someone who *delivers a curriculum* to children that is linked logically or empirically to the outcomes that are valued.

This difference between plans and actuality was reinforced by the researchers involved in the IEA Second International Mathematical Study (SIMS). These researchers made

a distinction between what they termed the *intended* (or planned) and *implemented* (or actual) curriculum. "The intended curriculum was defined as the formal prescribed curriculum contained in national courses of study. The implemented curriculum was the curriculum actually taught in the schools" (Westbury 1989, p. 20). The results of SIMS indicated quite clearly that estimates of the implemented curriculum were more strongly related to measures of student achievement than were estimates of the intended curriculum.

As we attempt to understand the impact of curriculum on teacher effectiveness, then, we are wise to seek factors related to the implemented, rather than intended, curriculum. Two such factors, supported by both theory and research, will be discussed in this chapter. The first factor has been labelled opportunity to learn; the second, academic work.

These two factors differ in several ways, most of which will be described later. One critical difference, however, will be discussed at this time. Opportunity to learn permits an examination of student learning opportunities over the long haul. That is, estimates of opportunity to learn are typically made at the end of a school term or year; these estimates are then examined in relation to end-of-term or end-of-year student achievement. In contrast, academic work provides ongoing information about student opportunities to learn. The work assigned to students can be examined on a daily or weekly basis. Together, then, academic work and opportunity to learn provide us with a rather complete perspective on the implemented curriculum.

1. Opportunity to learn

Opportunity to learn (OTL) can be defined as the extent to which students are given instruction on the knowledge and skills that are (1) related to the primary curricular goals and objectives, or (2) important enough to be included on outcome measures of student learning. Sometimes both of these definitions are combined into a single comprehensive definition.

According to the first definition, OTL is the emphasis given or the amount of time devoted to teaching and learning particular

subject matters (e.g., mathematics) or specific aspects of particular subject matters (e.g., mathematical concepts, mathematical algorithms, problem solving). Using this first definition, it becomes fairly obvious that primary school students in most countries have greater opportunity to learn language arts (including reading) than they do to learn mathematics. Approximately one-third of their total instructional time is spent on language arts, whereas approximately one-fifth is spent on mathematics. Students have far less opportunity to learn other academic subjects (World Bank 1990). Within language arts, students may have quite different opportunities to learn vocabulary, grammar, reading comprehension, and written composition. These differential opportunities can be estimated once again by the total time or number of lessons spent on each, or by the number of pages in the textbook devoted to each area.

In the more comprehensive definition of OTL, the critical issue is the relationship among the goals and objectives, the instruction provided to the students, and the outcome measures of the goals and objectives. When a strong relationship exists, the goals and objectives, instruction, and outcome measures are said to be in *alignment*. Misalignment, then, results in reduced OTL.

This comprehensive definition has been used for over a quarter of a century in studies conducted by the International Association for the Evaluation of Educational Achievement (IEA). As a result IEA researchers have developed a rather simple technique for estimating OTL. At the end of a particular term or year, teachers are asked to examine each item included on a given measure of student learning and respond to a series of questions. The following are examples of three quite common questions:

1. During the past term (or year), did you teach or review the knowledge or skill needed to answer the item correctly?
2. If your answer to the first question was *yes*, how much emphasis did you give to the knowledge or skill?
3. If your answer to the first question was *no*, why was the knowledge or skill neither taught nor reviewed?

Typical response options for each of these questions as well as a form for responding to the questions are included in *Appendix A*. Also in *Appendix A*, the different ways are discussed in which the responses given to these questions by a teacher can be scored and summed to arrive at a total score for that teacher.

However it is calculated, this total score represents a reasonable estimate of the opportunity that students in this teacher's classroom have had to learn the goals and objectives included on a measure of student learning given at the end of a term or year. The interpretation of this total score is straightforward: the larger the total score, the greater the students' opportunity to learn.

In view of the previous discussion, the importance of opportunity to learn in our study of teacher effectiveness is fairly obvious. As the number of items testing knowledge and skills *not taught* to students or *not emphasized* by the teacher increases, the validity of the measure of student learning relative to the instruction actually provided to the students *decreases*. Without valid measures of student learning, the influence of classroom, instructional, or teaching factors on student learning is likely to be minimized or, perhaps, go undetected even when it does exist. This fact is particularly important to consider in designing or interpreting the results of studies in which relationships between classroom activities or teacher-student interactions and student achievement are being investigated.

2. *Academic work*

In most classrooms, students are routinely given work they are expected to complete. This work may consist of stories or book chapters to read, essays or reports to write, mathematical or logical problems to solve, or scientific experiments to perform. As they complete this work, students are expected to acquire some knowledge or skill or engage in practice using the knowledge or skill. As a consequence, Doyle (1983) has referred to it as 'academic work.'

Quite obviously, academic work can be completed in school or at home. Equally obvious is the fact that work completed at

home is termed 'homework.' Homework is one of the few variables in international research that has been consistently associated with student learning (Anderson and Postlethwaite 1989).

Some educators have argued that the academic work assigned to students defines the curriculum for them (Zumwalt 1989). That is, inherent in most well planned and well organized pieces of academic work are rather explicit clues as to the goals and objectives (e.g., problem solving), content (e.g., linear equations), methods used to complete the work (e.g., "work in pairs and raise your hand if you need assistance") and the nature of acceptable answers (e.g., "show your work and be accurate to the first decimal point"). If students can glean such potentially useful information from their assigned work, educators and researchers can do likewise. In this regard, (Anderson 1987) prepared a series of questions that can be raised as educators and researchers review the work assigned to students. A checklist, derived from these questions, that can be used to examine the work assigned to students is displayed in *Appendix B*.

Inherent in this checklist are a series of issues to which teachers should attend as they prepare assignments for their students. While most of these issues are common sense, they unfortunately are not commonplace. As a consequence, they bear repeating. The purpose of the assigned work in terms of student learning should be clear to the student and the completion of the assigned work should lead the student to or toward the accomplishment of that purpose (checklist items 1, 2, and 3). Students should be made aware of what they need to do to complete the work and the way in which their work is to be evaluated (checklist items 4 and 5). Finally, the amount of work assigned to students should be appropriate in view of its purpose, the amount of time allocated to the work, and the credit that students will earn for completing it (e.g., the marks they will be assigned) (checklist item 6).

If the work assigned to students communicates the curriculum to them, then the study of assigned work may contribute one more piece to our teacher effectiveness puzzle. Furthermore, for many students, completing the work assigned to

them, rather than listening to their teachers, may be the real vehicle for their learning.

3. Recommendations for teacher effectiveness

Based on what is currently known about opportunity to learn and academic work, a series of recommendations can be offered to those interested in improving teacher effectiveness. These recommendations (and a brief discussion of each) are contained in the following sections.

Opportunity to learn

(i) Periodic estimates of opportunity to learn should be made, particularly in those subject matters which are learned wholly or substantially in school.

The denial of opportunity to learn is particularly acute in subject matters such as foreign languages, mathematics, and science. In many other subject matters, students have multiple opportunities to learn (including, most importantly, those provided by the home and community). For these subject matters, a regular monitoring of opportunity to learn may nonetheless be useful.

(ii) If students have little opportunity to learn what they are expected to learn and what is important for them to learn, then efforts should be made to increase their learning opportunities.

This recommendation is perhaps best discussed in terms of the concept of alignment mentioned earlier. If goals and objectives, measures of student learning, and the instruction provided to students are misaligned, then adjustments must be made. Quite clearly, this adjustment can start at any of three points: goals and objectives, measures of student learning, or instruction. The most reasonable starting point of alignment is goals and objectives. Once goals and objectives have been established, measures of student learning can be aligned with

those goals and objectives, and the instruction provided to students can be aligned with the goals and objectives as measured.

Academic work

(i) The academic work assigned to students should be chosen based not only on the relevance of the work to the goals and objectives, but the appropriateness of the work for the students themselves.

Work assigned to students should reflect some intricate balance between the goals and objectives of the teacher and their students' current level of knowledge and skills. The first priority in assigning work should be the goals and objectives being pursued. Nonetheless, the effective teacher ensures that the work is neither too difficult nor too easy for the students. If an error in judgement is made, however, the error should favour the more difficult end of the continuum. This type of error is consistent with the research findings that suggest that students need challenge (and variety) in order to persevere and succeed. If the difficulty 'error' is made, however, teachers must be willing and able to provide for the needs of students who initially cannot meet the demands.

(ii) Work, including homework, should be assigned to students on a regular and frequent basis.

Homework extends the amount of time available to students for learning. Thus, students in most need of additional time in order to learn or practice what they have learned should be given homework. The paradox in this situation, however, is that many of the students assigned homework are least likely to benefit from the homework being assigned. These students often come from homes in which parents do not assume the responsibility for seeing that their children complete the homework or are unable to provide the support and assistance to their children when they are having difficulty with their homework. As a consequence, teachers should make certain that students know what they are to

do for the homework and how they are to do it before they send it home.

(iii) Students should be held accountable for both the completion and quality of their work. In turn, teachers should ensure that their students possess the knowledge and skills needed to complete work of the quality expected of them before they are allowed to work on their own.

The importance of student accountability for both their classwork (Kounin 1970) and their homework (Walberg 1984) has been well documented. At the same time, however, it is difficult to hold students accountable for the quality of their work if they have not been taught or helped to develop the knowledge and skills they need to perform at the level of quality expected of them. As a consequence, activities such as 'guided practice', in which teachers work with students to ensure their success on initial activities, experiences, exercises, and problems before allowing them to work independently, have been advocated by both educators and researchers (Rosenshine and Stevens 1986).

(iv) While students are working in their classrooms, teachers should actively supervise the work and provide assistance to individual students or small groups of students in such a way that other students are not disturbed.

When students are given work following a period of direct instruction, teachers should not assume that these students are able to complete the work on their own. Rather, teachers should be actively engaged in monitoring and supervising students as they work. As problems arise, teachers should be available to provide assistance to these students. In this way, student work becomes another learning experience for the students.

(v) *Teachers should use the knowledge they gain from their students' work not only to evaluate students, but also to provide them with additional instruction targeted toward their errors and misunderstandings.*

There is a tendency on the part of some teachers to assign work to students for the sole purpose of evaluating their learning. Teachers should remember that the quality of students' work can also provide them insights concerning problems and deficiencies in their learning. When these problems and deficiencies have been identified, additional instruction can be arranged or provided to help students overcome them, rather than simply allowing them to accumulate.

4. *Recommendations for policy-makers and educational planners*

Opportunity to learn and academic work provide two important indicators of the extent to which the curriculum is being delivered to the students. Knowledge concerning these two indicators is a first step toward meaningful and successful curriculum reform. As a recent World Bank (1990) documents points out:

> "Most curriculum reforms have concentrated on redefining the courses to be taught and the number of hours officially allocated to each. Generally these changes have been ineffective. Successful curriculum reform efforts must tackle the more difficult issue of preparing a coherent, appropriately paced and sequenced instructional program and developing instructional materials". (p. 17)

Policy-makers and educational planners wishing to increase opportunity to learn and the meaningfulness and appropriateness of student work would be well advised to:

1. Develop end-of-year comprehensive assessment batteries in all academic subjects, particularly language arts and

mathematics since, in combination, these two subject matters account for over one-half of the total instructional time in primary school classrooms. The weighting of questions and items on these assessment batteries should reflect the importance and emphasis of the underlying knowledge and skills.

2. Periodically use instruments such as the one included in *Appendix A* to estimate the opportunity students in various classrooms have had to learn the knowledge and skills included on the comprehensive assessment batteries.
3. Include in teachers' guides carefully prepared assignments that provide the basis for meaningful and appropriate student work. Use an instrument such as the one included in *Appendix B* to guide the preparation of such assignments.

The *first two* implications are intended primarily for departments of teacher education in national or state ministries of education. Where the opportunity to learn is minimal, as is the case when what is actually taught in school reflects poorly the intended curriculum, it is for these agencies to take steps to increase the opportunity to learn. Both pre-service and in-service programmes can be used to help teachers understand the negative implications of misalignment. The *third* implication concerns the national curriculum development centres. In cases where such centres do not exist, this implication pertains to those groups responsible for the curriculum and writing of the textbooks.

III. Classroom environment and climate

Throughout the world, most teaching takes place in classrooms. These classrooms are typically inhabited by 20 or more students and a single adult, the teacher (Anderson *et al.* 1989). The ratio of one teacher to 20 or more students results in a natural imbalance between teaching and learning. When teachers teach in classrooms, they must, by necessity, direct a great deal of their teaching to *groups of students*. Even when they work with individual students, they must be aware of what other students in the group or class are doing. What students learn from this predominantly group-oriented teaching, on the other hand, depends to a large extent on the unique characteristics brought to the classroom by the *individual students*. As mentioned in Chapter I, the best predictor of what students know and can do at the end of some period of schooling is the knowledge and skills with which they entered that period of schooling.

Since teachers teach in classrooms, the physical aspects of these classrooms, the type and diversity of students who inhabit them, and the perceptions of these classrooms by these students all constrain teachers as they strive to increase their effectiveness. In terminology introduced by Dahllof (1971), these factors are a part of a larger set of 'frame factors' within which teachers must operate as they practice their craft. As organizational frames, these variables "merely *delimit* what is possible but do not *determine* the actual teaching process nor the outcome" (Lundgren, 1987, p. 528) (emphasis mine). Effective teachers, then, are able to operate successfully within these constraints or delimitations.

If they are to reduce the imbalance between teaching and learning, teachers must create classrooms that are conducive to effective teaching *and* learning. In creating such classrooms, teachers can alter or manipulate the physical environment, the psychological environment, or both. Manipulating the physical features of classrooms is generally a far easier task. Desks, chairs, and tables can be arranged in a variety of ways. Light and temperature can be increased or decreased. Paint, wall coverings, artwork, and plants can be used to enhance or detract from the attractiveness of the physical classroom environment.

While somewhat more difficult, teachers also can influence the psychological environment of the classroom. They can create classrooms in which work is the norm or ones in which play is the norm. They can set themselves up as authority figures in the classroom or attempt to establish a more democratic classroom organization. They can work to establish positive relationships among students or ignore or even discourage these relationships. Each of these choices quite likely impacts on the classroom environment as perceived by the students, that is, the psychological classroom environment or classroom climate.

In this chapter, we shall consider the differences between the physical and psychological environment of the classroom, examine what is known about the relationship of each of these two types of environments with effective teaching and learning, and offer a set of recommendations for the improvement of classroom environment and classroom climate.

1. Physical and psychological environments

The distinction between physical and psychological classroom environments should be quite obvious in light of the previous discussion. Physical environments exist independent of the people who inhabit them. Consequently, most, if not all, of the inhabitants of these environments would describe them in the same way. Psychological environments, on the other hand, exist only in the minds of those who live in these environments. In contrast to the consensual description of physical environments,

differences in descriptions of psychological environments should be expected.

Physical environments, teaching, and learning

The physical environment of the classroom includes variables such as classroom arrangement (Bennett 1987), equipment and materials (Ainley 1987), the number of inhabitants (Glass 1987), and seating patterns (Weinstein 1987). Perhaps the best description of the relationship among physical environments, teaching, and learning is that offered by Ainley (1987):

> "In the current research literature there is little consistent evidence of a strong effect of the materials and equipment in schools on achievement. ... There is, however, available a substantial amount of evidence that the physical environment of a school or classroom can effect the behaviour of people and their attitudes toward school and learning". (p. 539-540)

As mentioned in Chapter I, then, classroom environment and climate are indirectly, rather than directly, associated with student learning. That is, classroom environment and climate influence those who inhabit the classroom (that is, both teachers and students) who, in turn, influence what and how much students actually learn.

Many of the elements of the physical environment mentioned in the literature as influencing those who inhabit classrooms border on common sense. When the teacher is presenting information to an entire class of students, each student should have an unobstructed view of the teacher or the information presented by the teacher. When students are expected to engage in a discussion with other students, the physical arrangement of the classroom should facilitate (e.g., circular arrangements) rather than inhibit (e.g., static row and column arrangements) this discussion. When equipment and materials are needed, this equipment and these materials should be readily available to the students.

Despite the common sense notions of these components, there is ample evidence that differences among classrooms do exist, particularly in developing countries. Furthermore, the relationship between these differences in the physical environment and differences in student learning is especially clear in these countries. For example, Fuller (1986) presents evidence to suggest that the availability of student desks is associated with increased student learning. Similarly, Farrell (1989, p.63) was able to conclude that "children in these countries who have access to textbooks and other reading material learn more than those who do not and ... the more books they have the more they learn".

Psychological environments, teaching, and learning

The direct influence of the psychological environment on student learning has a great deal of empirical support. Walberg (1987, p. 553) defines the classroom psychological environment as the "climate or atmosphere of the class as a social group that potentially influences what students learn". Walberg further suggests that the psychological environment accounts for approximately 30 per cent of the variance in cognitive, affective, and behavioural outcomes, beyond that accounted for by input measures such as the entering ability or achievement of students.

Three components of this psychological environment have been found to be consistently associated with student learning: affect, task, and organization (Walberg 1987). When combined, these three components suggest that effective teachers are able to create classrooms that students perceive to be inviting, task-oriented, and well organized. *Inviting classrooms* are those in which students perceive there is mutual respect between teachers and students, positive and co-operative relationships among students, and a sense of satisfaction experienced by the students. *Task-oriented classrooms* are those in which students perceive there are definite goals to pursue and believe they are held accountable for achieving those goals. In addition, a large proportion of classroom time is spent working toward those goals. Finally, *well organized classrooms* are those in which students believe that expectations for behaviour and learning are made

clear and appropriate structure is provided to guide behaviour and learning. While the first two components of effective psychological environments are discussed in this chapter, the third component, organization, will be described in Chapter IV.

Assessing classroom environment and climate

Several instruments have been developed to assess classroom environment and climate. The most technically sound and frequently used instruments are the Learning Environment Inventory (Fraser 1978), the My Class Inventory (Walberg 1974), the Classroom Environment Scale (Trickett and Moos 1973), and the Individualized Classroom Environment Questionnaire (Rentoul and Fraser 1979).

Appendix C includes a set of eight rating scales developed by Emmer and his colleagues (1982) that are useful in assessing classroom environment and climate. *Appendix D* contains brief written descriptions of each of the eight scales. The first three scales are related to the physical environment of the classroom. The second three scales are related to the task organization of the classroom. The final two scales are related to the affective dimension of the classroom. As mentioned earlier, scales related to the organization of the classroom are included in the next chapter.

The rating scales included in *Appendix C* are intended to be used by independent observers in the classroom (e.g., policy-makers, administrators, supervisors, researchers). However, they can be completed by older students or the teachers themselves as they reflect back on their lessons. These scales are not as psychometrically sound as those mentioned earlier. They are, however, linked to the recommendations offered in the following section. As a consequence, responses to these scales are likely to provide useful information to those interested in identifying areas of classroom environment and climate in which improvement is needed and assessing the effectiveness of the improvement efforts of teachers.

2. *Recommendations for teacher effectiveness*

Based on what is currently known about classroom environment and climate, three general recommendations can be given to those interested in improving teacher effectiveness in these areas. These recommendations (and a brief discussion of each) are contained in this section.

(i) Teachers should create attractive and functional classrooms. Part of the functionality of classrooms concerns the availability of necessary equipment and materials.

Stated simply, unattractive and dysfunctional classrooms are detrimental to teacher effectiveness. Effective teachers use colour, light, temperature, and displays to create attractive and functional classrooms. Proper arrangement of furniture also contributes to the functionality of classrooms. Furniture is arranged so that students are oriented to the primary source or sources of information (e.g., the teacher, audio-visual materials), while at the same time having access to other sources or activities (e.g., work areas, computers) without disturbing others in the classroom. The importance of attractive and functional classrooms has been demonstrated quite clearly in an experimental study in Thailand (Nitsaisook and Anderson 1989).

(ii) Teachers should create task-oriented classrooms.

Task-oriented classrooms are characterized by many educators and researchers as 'businesslike'. That is, both teachers and students have jobs to do. The performance of these jobs and the accomplishment of the goals and objectives associated with this performance are paramount in the minds of both students and teachers. It is important to point out that this recommendation does not mean that the life of teachers and students in classrooms should be 'all work and no play'. On the contrary, in task-oriented classrooms there is ample opportunity for both work and play since the emphasis is on what is being accomplished, rather than

what is being done. The importance of task-oriented classrooms has been documented by Anderson *et al.* (1989).

(iii) Teachers should develop classrooms in which there is mutual respect between teachers and students and a high degree of cohesiveness among the students themselves.

There are several things teachers can do to enhance mutual respect between themselves and their students.

First, they can engage in honest communication with their students. If they do not know the answer to a question raised by a student, they can simply say that they do not know the answer (rather than bluffing an answer). When their students are talking, they can be genuinely interested in what their students are saying (rather than appear to be listening, while their minds are elsewhere).

Second, teachers can create classrooms in which students are expected to co-operate with their classmates in order to learn. In this way, students come to view their classmates as valuable learning resources, rather than as threats to their academic survival and success (Johnson and Johnson 1989).

Third, teachers can communicate to their students that they expect all of them to learn and to learn well. The communication of high expectations has been found to be associated with higher levels of student learning (Avalos and Haddad 1981, Good 1987).

Finally, teachers must treat all students fairly. In this regard, teachers should define academic excellence by objective standards, not by peer comparison. In addition, all students should know about the rewards for academic success and what they need to do to get them.

3. *Recommendations for policy-makers and educational planners*

Educational planners must ensure that teachers have the resources needed to create attractive and functional classrooms.

They must also develop mechanisms for collecting information from schools about their resources on a regular basis.

The results of several studies conducted in developing countries have supported the educational value of the availability of textbooks and reading materials, the size and quality of the library, and the quality of the school building (Fuller 1986; World Bank 1990). Equally importantly, however, is the fact that the lack of these resources severely limit what teachers can do in their efforts to become more effective. Farrell (1989) elaborates on this point:

> "There is ... some indication that the availability of books allows teachers to assign homework, one of the 'promising possibilities' for raising student achievement. Beyond this, there is some observational evidence that the presence of textbooks in the classroom allows teachers to diversify their teaching repertoire and work with small groups and individual students. In a classroom with no books, about the only teaching-learning style possible is teacher lecture and group recitation and rote memorization". (p. 63)

Once adequate resources have been made available, departments of teacher education must help teachers learn to use those resources to create classrooms that promote positive attitudes, constructive classroom behaviour, and ultimately, increased student learning.

One final note about the recommendations for teacher effectiveness made earlier is in order. These recommendations are based primarily on research conducted in the USA and Australia. Quite clearly, what constitutes an attractive and functional classroom environment may differ from one culture to the next (although there is some evidence that structured and task-oriented learning environments are beneficial to students in several countries (Anderson *et al.* 1989). Similarly, the desired teacher-student or student-student relationships quite likely depends on cultural values -- although there is some evidence that in several countries authoritarian teacher-student relationships are detrimental to the learning of students (Avalos and Haddad 1981)). Additional research on classroom climate in developing countries is, therefore, needed. It is for the national or state

departments of teacher education, possibly in conjunction with the research unit of the ministry of education, to either undertake such research or cause it to be undertaken. The instrument contained in *Appendix C* and *Appendix D* may provide a starting point for such research efforts.

IV. Classroom organization and management

In the previous chapter, ways in which classrooms could be created so as to be physically appealing and psychologically inviting and demanding were discussed. Once such classrooms have been created, the concern of the teacher shifts to ways in which these classrooms can be *organized* to promote effective teaching and learning, and ways in which the large numbers of students who inhabit these classrooms can be *managed.*

Classroom organization refers to the academic and social arrangements of students within classrooms. Classrooms can be composed of students who are similar or quite different in terms of their ability or achievement levels. In these classrooms, teachers can teach to and work with the entire class of students, smaller groups of students, or individual students. Also, in these classrooms, teachers can expect students to work on their own or with one another.

In contrast with classroom organization, classroom management pertains to the ways in which teachers promote positive, pro-social student behaviour and deal with misbehaviour and disruptive behaviour. In this regard, two key aspects of classroom management have been identified: preventing behavioural problems from occurring, and reacting to behavioural problems that have occurred. This latter aspect of classroom management is often referred to as 'discipline'.

The importance of classroom organization and management in the larger context of teacher effectiveness is most clearly seen by examining the evidence that beginning or novice

teachers spend large amounts of their time on classroom organization and management (Ryan and Phillips 1982; Berliner 1988). Furthermore, in many countries, this increased amount of time on organization and management apparently is detrimental to student learning (Anderson *et al.* 1989). Thus, one may reasonably assume that until novice teachers are able to properly organize their classrooms and manage their students, they are unable to focus their attention and efforts on the teaching-learning process.

1. Classroom organization

As mentioned in the previous chapter, teaching and learning throughout the world occur in social settings called classrooms. Some of these classrooms are composed of students who are very similar to one another in terms of their abilities, prior achievement, and a variety of other characteristics. Such classrooms are labelled homogeneous classrooms and the practice of assigning students to such classrooms is referred to by a variety of names: ability grouping (Goldberg, Passow, and Justman 1966), streaming (Barker-Lunn 1970), and tracking (Oakes 1985). Other classrooms contain students who are very dissimilar in terms of their abilities, prior achievement, and other characteristics. These classrooms are termed heterogeneous classrooms.

A great deal of research comparing the relative effectiveness of homogeneous and heterogeneous classes on student achievement has been conducted. The results of this research can be summarized fairly simply. Less academically-able students in homogeneous classes tend to achieve less well than less academically-able students in heterogeneous classes (Slavin 1987). On the other hand, more academically-able students in homogeneous classes tend to attain levels of achievement that are either similar to (Slavin 1987) or higher than (Kulik and Kulik 1988) the levels achieved by more academically-able students in heterogeneous classes. In schools that practice homogeneous grouping, then, differences in the achievement of more and less academically-able students increase over the years of schooling.

As a consequence, Oakes (1985) contends that such schools 'structure inequality'.

Actually, the results of the research comparing homogeneous and heterogeneous classes on student achievement are not as obvious as they appear at first glance. As indicated in Chapter I, classroom organization and management are only *indirectly* related to student achievement. The disparities in achievement mentioned above are more likely attributed to the ways in which low and high ability students are treated when placed in homogeneous groups than to group membership per se. Hallinan (1984), for example, concluded that lower ability students in homogeneous groups (1) received instruction at a slower pace, (2) had more time off-task for administrative or managerial reasons, and (3) were taught using materials that were less interesting than similar students in heterogeneous groups. In contrast, Kulik and Kulik (1988) suggested that one of the keys to the success of high ability students in homogeneous classes was that the curriculum was accelerated for these students. That is, they received more difficult and complex content at a more rapid pace.

Whether operating in heterogeneous or homogeneous classrooms, most teachers address the vast majority of their teaching to the entire class of students (Anderson *et al.* 1989). They talk to all students at the same time (frequently asking questions and reacting to the students' answers) and give these students the same work to perform. This recurrent pattern occurs with such frequency in so many classrooms that the phrase 'recitation-seatwork' has been used to describe it.

During the seatwork portion of the lesson, students are expected to work on their assignments by themselves. This is despite that fact they are typically given the same assignments and often are seated about tables in groups. As Galton, Simon, and Croll (1980) pointed out in their study of primary schools "though children are typically seated in groups, for the great majority of time they work as individuals, concentrating on their own individual tasks" (p. 70). The isolation of students from each other is so noticeable in many classrooms that Johnson (1981, p. 5) referred to interaction between or among students as "the neglected variable in education".

Effective teachers are able to achieve a balance between recitation and seatwork. Too much seatwork, particularly, has been associated with lower levels of student achievement (Fisher *et al.* 1980). Furthermore, effective teachers have found ways to unleash the power of student-student interactions in productive ways. The formation of peer work groups (Stodolosky 1984) and the use of co-operative learning strategies (Johnson and Johnson 1989; Slavin 1987) are examples of the productive use of these interactions among students.

2. *Classroom management*

As mentioned earlier in this chapter, classroom management can be divided into two categories: *preventive* and *reactive*. Research conducted during the past quarter of a century in the USA clearly suggests that more effective classroom managers differ from less effective classroom managers in their ability to prevent problems from occurring, not in the ability to successfully react to behavioural problems (Brophy and Good 1986; Doyle 1986). The establishment of rules and routines, and the use of certain teacher behaviours are two factors associated with effective preventive classroom management.

In general, rules are prohibitions on student behaviour and, as a consequence, are often stated negatively. "Do not talk without raising your hand" is a rule used by teachers in many American schools. Routines, on the other hand, are sequences of steps that students are to follow as they perform classroom activities that occur with some degree of regularity. Routines established by teachers in many classrooms include those for entering and leaving the classroom, participating in a class discussions or conversations with the teacher, completing and submitting homework, and taking tests.

For rules and routines to be effective, they must be planned in advance, relatively few in number, communicated clearly to students (along with a justification of their need), and have explicit consequences for their violation. At least initially, compliance with the rules and routines must be monitored, praise given as appropriate to those students who do comply, and

sanctions or punishments consistently meted out to those who do not. Eventually, explicit and meaningful rules and routines should enable students to behave appropriately without direct teacher supervision and intervention. As Good and Brophy (1987) suggest "the teacher's goal is to develop students' inner self-control, not merely to exert control over them" (p. 228).

A set of teacher behaviours associated with preventive classroom management, first identified by Kounin (1970), has been validated by numerous other studies over the past two decades (Brophy and Good 1986; Doyle, 1986). These behaviours include with-it-ness (awareness of everything that is happening in the classroom at all times), group alerting (using a standard and predictable signal to get the students' attention), overlappingness (the ability to deal effectively with more than one thing at the same time), momentum (keeping events and activities in the class moving at a fairly brisk pace), accountability (letting students know they are responsible for their learning and the quality of their work), and variety and challenge in seatwork (providing assignments that offer sufficient challenge and variety to maintain students' interest and attention). Many of these behaviours were included in a successful teacher training programme developed in Indonesia (Djalil and Anderson 1989).

Before moving to the recommendations for this chapter, a final note on classroom management in developing countries is in order. Students in developing countries appear to engage in less misbehaviour and less disruptive behaviour than students in Western countries. In addition, they spend greater proportions of their time engaged in learning or on-task than do their Western peers (Anderson *et al.* 1989). As a consequence, concerns for classroom management may not be as great in developing countries as they are in Western Countries. In this regard, Nitsaisook and Anderson (1989) found that only approximately one-third of the teachers in Thailand who were taught to begin their lessons with from one to two minutes of 'preliminary management' activities did so. The majority of these teachers apparently saw no need to do so. On the other hand, those few teachers who did engage in preliminary management activities spent almost twice as much time in these activities as was

recommended. Thus, some teachers in these countries may need advice concerning classroom management. *Appendix E* contains a set of rating scales that can be used to identify these teachers. *Appendix F* includes brief descriptions for each of these rating scales.

3. Recommendations for teaching effectiveness

In this final section, separate recommendations are made for classroom organization and classroom management. Since the majority of these recommendations are self-explanatory, they are simply listed. Any explanation that seems needed is included in the statement of the recommendation itself.

Classroom organization

1. When introducing new content to students, whole class or large group instruction, actively led by the teacher, is preferable to small group or individualized instruction. Under almost all conditions, too much individualized instruction is not a good idea when introducing new material to students.
2. Small groups should be formed within the classroom as needed to make sure that all students learn thoroughly. Small groups may be particularly useful when students are being taught intellectual skills such as expressing and defending opinions, following an argument, and solving problems. Small groups may also be useful when teachers want to work intensively with students who are having some difficulty learning the material presented.
3. When small groups are formed, students in all groups must receive high quality instruction; specifically, the content and assignments given to students in each group must be challenging and presented at an appropriate pace. If errors in challenge and pace are made by teachers (as they likely will from time to time), they should be made on the side of greater challenge and a more rapid pace.

4. The formation of groups composed of students varying in their abilities (rather than similar in their abilities) may provide many students with both the assistance and the models they need in order to succeed. The formation of homogeneous groups of low ability students effectively removes students as a source of motivation and assistance for other students.
5. When working with small groups, teachers must maintain an awareness of the rest of the students in the class, taking action as necessary to keep them involved in learning and on-task. Furthermore, giving students outside the group assignments that are challenging, varied, and interesting, and that have identifiable products or outcomes (e.g., solutions to problems) may reduce the need for teachers to attend to them. Such assignments possess what Kounin and Sherman (1978) refer to as 'holding power' since they apparently 'hold' the students' attention to the task at hand without the direct involvement of the teacher.

Classroom management

1. Teachers should keep non-instructional time to a minimum by beginning and ending lessons on time, keeping transitions between activities to a minimum, developing and implementing meaningful and efficient rules and routines, and managing classrooms so as to minimize disruptive behaviour.
2. Standards for appropriate classroom behaviour should be written, taught, and reviewed periodically from the beginning of the year or the start of a new course. In this way, students are able to internalize the expectations teachers have for their behaviour and to exhibit appropriate behaviour without the direct supervision or intervention by their teachers. The teaching of behavioural expectations is no less important than the teaching of academic expectations.
3. Teachers should reinforce positive, pro-social behaviours, especially with students who have a history of behaviour problems. Such students need to see value in behaving in

appropriate ways. Praise and approval by teachers (and peers in later school years) are ways of helping these students value positive, pro-social behaviours.

4. Consistent, equitable sanctions and punishment for inappropriate behaviour should be applied to all students. These actions should be carried out quickly and are clearly linked to students' inappropriate behaviour. When sanctions and punishment are necessary, the teacher should focus on the inappropriate *behaviour*, not the student's *personality*.
5. Teachers should be able to convey to students that they (a) expect them to attend when there is something important going on in the classroom (group alerting), (b) know at all times what is going on in the classroom (with-it-ness), (c) are able to handle multiple matters at the same time (overlappingness), (d) are not likely to be distracted from the primary purpose of the lesson they are conducting (momentum), and (e) believe that students are responsible for their learning and the quality of their work (accountability).

4. *Recommendations for policy-makers and educational planners*

As policy-makers and educational planners work toward increasing teacher effectiveness, they should keep in mind the goals or purposes of classroom organization and management. Decisions concerning classroom organization are made in order to deal effectively with the diversity of students in the classroom (Barr and Dreeben 1983). For example, the greater the diversity among students in a classroom, the more likely it is that teachers will need to form groups or work with small groups of students separately if they are to effectively teach all students in the classroom. Decisions concerning classroom management are made in order to maximize the productive use of available classroom time.

With these purposes or goals in mind, two areas of action are particularly important for policy-makers and educational planners to consider. First, clear policies should be established for classroom organization. Rather than mandate a particular form of

classroom organization, however, these policies should require (1) that school administrators and teachers achieve a balance between heterogeneously and homogeneously organized classrooms and between teacher-student verbal interaction and seatwork, and (2) that teachers use educational practices that are consistent with the particular form of classroom organization in place at any given time.

Second, in order to help school administrators and teachers understand and properly implement these policies, a series of in-service training sessions should be designed and carried out. These sessions should help teachers develop knowledge and skills in two major areas: preventive classroom management (including the establishment and maintenance of rules and routines) and forming and working with small groups (including the development of activities and assignments for the remainder of students in the classroom). The training programme developed by the Thailand Ministry of Education (Nitsaisook and Anderson 1989) is a useful model for the first area.

V. The structure of lessons

Not only does teaching occur within the social context of the classroom, teaching also occurs with the academic context of the lesson. Thus, as Erickson (1982) points out, teachers and students operate within the context of both a social participation structure and an academic task structure. In Chapters III and IV, the social context of the classroom was discussed. In this chapter, the academic context of the lesson is described.

1. The purpose and sequence of activities

In simplest terms, a lesson consists of a sequence of activities that occurs in a classroom during a finite time period (most frequently, a single class session of from 30 minutes to an hour) for some purpose. As can be seen in the definition, then, lessons have three primary features: (a) activities, (b) purpose, and (c) sequence and time period.

Activities

The number of activities that occur in most classrooms is quite limited. Berliner (1983) identified ten types of activities, while Stodolsky (1988) suggested fourteen. In this regard, Anderson (1987a) reports on a cross-national study of classrooms in which nine types of activities were included on a classroom observation instrument. To ensure that all of the observed activities were coded, observers were encouraged to use a tenth activity code, labelled 'other', if an observed activity did not meet

the criteria for placing it into any of the nine types of activities included on the instrument. In five of the nine participating countries, *none* of the observed activities were coded as 'other'. That is, the nine types of activities included on the observation form accounted for every activity that was observed in these countries. In the remaining four countries, 'other' activities accounted for less than eight percent of the total number of activities observed. Thus, considering analyses performed by Berliner (1983) and Stodolsky (1988), a reasonable estimate of the number of activities that occur within classrooms would fall somewhere between nine and fourteen.

As these types of activities are examined, they can be placed into one of three more global categories: presentation, work and play, and housekeeping. *Presentation* includes those activities in which the teacher is directly involved in providing ideas or information to large groups of students (e.g., lecturing, conducting recitations, or leading discussions) or uses some other means to present ideas and information to these students (e.g., showing films or filmstrips). *Work and play* includes those activities in which students, individually or collectively, are expected to complete a task (work) or have fun (play) primarily on their own. While teachers may intervene in these activities to provide assistance to the students, the students, not the teacher, is the focal point of the activity. Games and contests, seatwork, silent reading, and construction activities are examples which would be included in the category 'work or play'. Finally, *housekeeping* includes activities related to the administration of the classroom. Berliner (1983, p.4), for example, defines housekeeping as "any activity in which students are informed of daily events and in which rituals are performed". He includes as examples such as 'picking the weekly traffic monitor', 'collecting milk money', and making a variety of announcements.

Purpose

Numerous schemes have been suggested for classifying activities in terms of their purposes. In general, these schemes can be arranged from general to specific. Arguably, the most general

schemes for classifying purposes of activities are the cognitive (Bloom *et al.* 1956), affective (Krathwohl *et al.* 1964), and psychomotor (Harrow 1972) taxonomies of educational objectives. This scheme was based primarily on an analysis of the objectives that teachers set for their students (that is, what their students should learn).

Gagne (1972) developed a classification scheme based on a psychological analysis of learning and the conditions under which learning is most likely to occur. Three of Gagne's categories are clearly cognitive (verbal information, intellectual skills, and cognitive strategies), one category is affective (attitudes), and the other is psychomotor (motor skills).

Finally, Gump (1967) developed a classification scheme based on the activities that he observed in classrooms. As a result of his observations, Gump suggested three general purposes for most of the activities that he observed: academic (that is, students are to learn some subject matter by participating in the activity), social (that is, students are to learn something about their fellow students or teacher, or develop social skills by participating in the activity), and recreational (that is, students are to have fun and enjoy participating in the activity).

Within each of these general schemes, more specific schemes have been identified. By far, the majority of work in this area has pertained to the classification of activities according to their cognitive or intellectual purposes. In this regard, Bloom *et al.*. (1956), suggested that an activity or sequence of activities can lead to the development of student knowledge, comprehension, application, or the ability of students to analyze, synthesize, and evaluate. Taking a slightly different twist, Gagne (1972), as mentioned earlier, differentiated among three types of intellectual purposes: verbal information, intellectual skills, and cognitive strategies. More recently, Doyle (1983), combining activities with purposes or goals, identified four types of academic tasks: memory, procedural or routine, comprehension or understanding, and opinion.

Within the category of academic purposes, still smaller sub-divisions have been suggested by some educators and researchers. In general, these sub-divisions have been based on

the intentions of the teacher relative to the students being taught. For example, Anderson *et al.* (1989) suggested that teachers may intend to use the activity to (1) introduce the academic content to students, (2) have students master the academic content (an activity which often includes practice with content previously introduced), (3) review academic content previously taught (an activity which also could include practice), and (4) help students correct mistakes and misunderstandings about the academic content. The results of the cross-national study reported by Anderson *et al.* (1989) suggest that the majority of classroom time is spent reviewing academic content previously taught. Obviously, this amount of review reduces the pace at which academic content is presented to students, which in turn, is negatively related to the amount that students learn.

One final comment seems appropriate before we leave the discussion of the varied purposes of activities. Quite obviously, a single activity may be intended to accomplish multiple purposes and thus be placed into more than one of these general categories. A discussion activity in social studies, for example, may be intended to help students understand the concept of 'fair trade' (an academic purpose), while at the same time helping them appreciate the value of their fellow students (a social purpose). Similarly, a mathematics worksheet containing puzzles to be solved by students may be intended to be very enjoyable to the students (a recreational purpose), while at the same time helping them develop important reasoning skills (an academic purpose).

Sequence and time period

Since all activities cannot occur within the classroom at the same time, some attention must be paid to the sequence within which the activities will occur. Furthermore, the issue of how long each activity will last should be addressed. In recent years, more attention has been given to the sequence of the activities than to their length, although some evidence on both sequence and length has been gathered. Much of this evidence can be summarized in graphical form (see Table 5.1).

Table 5.1 Lesson structure for teacher-directed lessons

Activity	Function	
Housekeeping	Get ready	
Presentation		
Phase I	Orientation of students	
Phase II	Help students master objective	Feedback and correctives
Phase III	Check for understanding (guided practice)	
Work	Over-learning/retention (independent practice)	
Housekeeping	Clean up/pack up	

Note: The presentation-work sequence can and often does occur several times during a single lesson (Anderson *et al.* 1989). In fact, when difficult material is being taught, Rosenshine and Stevens (1986) recommend a number of presentation-work sequences during a single lesson.

Many lessons in the basic skills (e.g., reading, writing, and mathematics) have a common structure. They begin with a brief housekeeping activity. The purpose of this initial activity is to get the students physically prepared for learning (e.g., making certain they have textbooks, pencils, and the like).

The lesson continues with a presentation activity. Within this presentation activity there are several stages or phases, each intended to accomplish a slightly different, but related, purpose. The first phase is often intended to orient the student to the lesson. Typical activities in this phase include informing students of the

lesson objective, reviewing knowledge and skills that are needed for or helpful in attaining the lesson objective, and creating in the students a need or desire to achieve the objective. The second phase frequently consists of an explanation, typically made by the teacher, of the knowledge and skills related to the lesson objective. The purpose of this phase is to help students begin to master the objective. During the third phase the teacher checks to ensure that students are understanding what is being presented and see the relationship between what is being presented and the lesson objective. The main activity during this phase is asking questions in either oral or written form, although it should be pointed out that questions for this purpose can be asked during almost any phase of the lesson.

Once the teacher is fairly certain that the students do in fact understand the material being presented and have grasped the objective being taught, the students are assigned some type of work to complete on their own. They may be given a set of exercises to complete, a series of problems to solve, an experiment to perform, or a chapter they are to read and, after reading it, answer some questions. Since the work is assigned by the teacher, it is called assigned work or simply an assignment. The primary purpose of these assignments is to foster over-learning and retention. Over-learning most skills results in automaticity, that is, the ability to perform the skills without a minimum of conscious thought. Retention, on the other hand, makes the knowledge available to students when they need it at some later time.

Within a single lesson, several sequences of presentation and work activities may take place. In fact, the data summarized by Anderson *et al.* (1989) suggest that multiple presentation-work sequences are the rule, not the exception, in most classrooms throughout the world. Multiple presentation-work sequences within a lesson serve at least two purposes. First, they break the monotony for the students. Second, they are particularly useful when the objective is difficult since they enable the teacher and students to divide the objective into smaller parts and formally check on the progress of students in each part before moving to the next.

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The final activity of most lessons is another housekeeping one. Typically, things need to be picked up and put away. Final comments need to be made by the teacher. Some "cleaning up" and 'closing up' activities apparently are needed to signal to students that the lesson is over.

2. *Recommendations for teacher effectiveness*

Based on what is currently known about lesson structure, the following recommendations can be offered. Before any changes in lesson structure should be made, however, an examination should be made of the structure of the lessons currently in operation. *Appendix G* contains a checklist that can be used by teachers to report on the activities they include in their lessons or by school administrators or researchers during observations of the lessons. If some aspect of the lesson structure is found to be problematic, the following recommendations may be useful.

(i) Students should be carefully oriented to their lessons.

Some time should be taken at the beginning of each lesson to orient the students to the lesson. During this orientation period, the aims or objectives of the lesson should be explained in simple everyday language. It may also be useful to refer to these aims or objectives throughout the lesson to maintain students' focus. An overview of the lesson activities may also be helpful in orienting the students (e.g., first, we will do this; second, you will do that). Students should be reminded of the knowledge and skills that, although previously taught, are either needed to master or helpful in mastering the lesson objectives. If work previously assigned to students is related to the lesson, this work should be checked and errors and misunderstandings corrected before moving on. Ways should be found to arouse students' curiosity or interest. Posing challenging problems and discussing the relevance of the objective or the importance of mastering the objective are two such ways.

(ii) The presentations made to the students should be clear and focused.

A focused presentation has the students' mastery of the lesson objectives as its primary emphasis. Presentations in which the teacher wanders off the topic or in which a film shown to the students is tangentially related to the lesson objective are unfocused. Issues pertaining to the clarity of presentations will be discussed in Chapter VI.

(iii) The extent to which students understand the material being presented and/or can correctly or appropriately apply the material presented should be monitored periodically and systematically.

Several mechanisms can be used to monitor student understanding and mastery. Teachers can ask questions which focus on the material being covered and the objectives of the lesson. A more detailed discussion of teacher questioning is included in Chapter VI. Teachers can assign one or two exercises or problems related to the lesson objectives that students can work individually or in small groups. If students work individually, teachers can have one of the students give the answer or demonstrate the solution, or they can circulate to see how many students have the correct answer or solution. If students work in small groups, group members can check the correctness or adequacy of each other's answers or solutions. The important thing to remember is that students should have their understanding or application checked *before* they are permitted to work independently with the material. Specifically, Rosenshine and Stevens (1986) suggest that questions should be asked and exercises and problems assigned until "students are fluid"; that is, until there is a success rate of 80 or higher.

(iv) *Once teachers are reasonably certain that students have learned the material and mastered the objectives, they should provide opportunities for students to independently practice what they have learned.*

The purpose of independent practice is to ensure that students remember what they have been taught and are able to apply routinely what they have learned. Rosenshine and Stevens (1986) suggest that independent practice is needed for students to become 'independent' and 'confident'. Thus, assignments to be completed in class or at home are useful tools for ensuring that students have in fact learned or can use successfully the material and objectives to which they are exposed and expected to learn. It is not sufficient for work to be assigned, however. The quality of the work must be examined and students must be encouraged to produce high quality work (Walberg 1984).

(v) *Throughout the lesson, students should be informed of their progress and observed mistakes and misunderstandings should be corrected before they accumulate and interfere with future learning. In current educational terminology, this teaching function is referred to as 'feedback and correctives' or 'corrective feedback'.*

There are many opportunities for teachers to engage in feedback and correctives. Within presentation activities, teachers may provide alternate modes of presentation because they sense their students are not following the presentation being made. As students complete assignments at their seats, teachers can examine their work and provide additional instruction as needed. At the end of extended periods of instruction, teachers can more formally assess the learning of their students and devote entire lessons to the identification and correction of errors and misunderstandings (Guskey 1985).

(vi) Lessons should be viewed by teachers and students as parts of larger units of instruction.

Teachers and students who view the lesson as the primary vehicle of learning are quite likely to be guilty of not seeing the forest for the trees. Larger units of instruction, such as textbook chapters or topics in a particular subject matter, are likely to be more important in enhancing learning than are lessons.

The mastery learning approach to instruction relies on the development of larger instructional units; units that typically require from two to three weeks to teach students (Guskey 1985; Block, Efthim, and Burns 1989). Within each unit, the most important knowledge and skills are identified. Questions, problems, and/or test items related to this knowledge and these skills are prepared and incorporated into one of at least two forms of an end-of-unit test (called a formative test) and standards indicating mastery of the knowledge and skills on all forms are established.

The knowledge and skills are organized into cohesive lessons, which they are sequenced from the beginning of the unit to the end. Near the end of each unit, one form of the end-of-unit test is administered to the students. Based on their performance on the test, students are divided into *two* groups: those whose performance indicates mastery of the important knowledge and skills, and those whose performance does not. Formal feedback and correctives are provided to those students in the second group (the 'non-masters'). Students in the first group may serve as tutors to those in the second group or may work on additional activities which are intended to increase their knowledge, skill, or interest in the material included in the unit.

After some fixed amount of time, students in the non-mastery group are administered a second form of the end-of-unit test. Once again, students are divided into 'masters' and 'non-masters' and additional feedback and correctives provided to the 'non-masters' as needed. Mastery learning has been used successfully in several developing countries: Indonesia (Soemarso *et al.* 1980), the Republic of Korea (Kim *et al.* 1969), and Malaysia (Nordin 1980).

3. Recommendations for educational planners

The organization of a subject matter for teaching to students is a very complex issue. The subject matter is first organized into grade levels (that is, grade 1, grade 2, and so on). This level of organization can be termed the curricular level and the grade level units can be termed curricular units. Within each grade level, the subject matter is organized into topics, book chapters, or, more generally, units of instruction. This second level of organization can be termed the instructional level. Within each unit of instruction, the subject matter is organized into lessons. This third level of organization can be termed the teaching level.

From this analysis, it seems fairly obvious that it is at the lesson level that teachers can have their greatest effect. As described in this chapter, their effect is likely to be maximized when lessons have clear purposes, include activities which are explicitly related to the purposes, and have a structure which is functional and efficient. Nonetheless, their effectiveness will be substantially reduced if the relationship of the lessons with the units of instruction and the larger grade-level curricular units has not been carefully considered.

In this vein, curriculum planners can help teachers become more effective in two ways. First, relationships among curricular units, instructional units, and lessons should be made explicit. Documents describing and illustrating these integral relationships can be prepared. Second, teacher guides should include discussions of the structure of the lessons to be presented to students in terms of their purposes, related activities, and activity sequences. For each lesson, useful teaching examples and illustrations should be included to enhance the clarity of the teacher's presentation. Examples of questions that can be used to check students' understanding can be included, as can short, valid assignments that are linked clearly to the purpose of the lesson. These assignments can serve as diagnostic tools for monitoring student learning and identifying learning difficulties.

VI. Communication between teachers and students

If you were to walk past most classrooms in most schools in most countries, you would hear a great deal of talking. Talking, it seems, is the preferred medium of teaching and instruction. Talking is so prevalent in classrooms that Bellack, Kliebard, Hyman, and Smith (1966, p.1) were able to assert almost a quarter of a century ago that "few classroom activities can be carried out without the use of language. ... Classroom activities are carried on in large part by means of verbal interactions between students and teachers". For even the most naïve classroom observer, it should not be surprising to learn that in most classrooms, teachers do most of the talking (Flanders 1970; Anderson *et al.* 1989). It may be somewhat more surprising, although not totally unexpected, to learn that teachers have dominated the talk that occurs in classrooms for decades (Cuban 1984).

When teachers talk to their students, they engage them in a rather repetitious set of activities. They tell students things, ask them questions, allow or encourage them to answer the questions, and react to their answers (or lack of answers). Students can also tell teachers things, ask them questions, give them an opportunity to answer the questions, and react to their answers. However, this set of student directed activities occurs far less often than the set of teacher-directed ones. Furthermore, these teacher directed activities occur in a fairly predictable sequence; one which Bellack and his colleagues (1966) have labelled 'structuring - soliciting - responding - reacting'.

In addition to talking to students, teachers also show them what they need to know or are expected to learn. They show

pictures (moving or still), graphs, maps, charts, and other visual displays. They demonstrate for students the ways in which they want things done or the skills they intend students to acquire. When teachers show things to students, they quite often talk to them at the same time. As a consequence, teachers must either possess or be able to acquire skills related to 'showing and telling' if they are to be effective in their classrooms.

1. Structuring, soliciting, responding, reacting and non-verbal communication

Structuring refers to "attempts by teachers and less often by students to supply the content of lessons and to provide both the long-term and the moment-by-moment framework that guide the course that those lessons take" (Doenua 1987a, p. 398). In other words, teachers talk about the structure of the subject matter (e.g., the major concepts, their interrelationships, and the required skills) as well as the structure of the lessons in which the subject matter is being presented or taught (e.g., the sequence of activities, directions for assignments).

Soliciting refers to "attempts by teachers and, again, less often by students to elicit a verbal or non-verbal behaviour from a classroom member" (Doenua 1987b, p. 407). Most often, these attempts are in the form of questions that teachers ask students. They may also take the form of commands or requests. Far less frequently, physical prodding may be used.

Responding refers to "any verbal or non-verbal act designed to fulfill the expectations implicit in the questions, commands, or requests of others" (Power 1987, p. 413). Since teachers do most of the soliciting in classrooms, students do most of the responding. Individual students may answer questions posed by the teacher, while entire classes of students may comply with a command to begin working on the problems included in the textbook. Teachers do respond, although, once again, not as frequently as students. A teacher who provides help to a student who is working on an assignment *at the student's request* is responding.

Reacting refers to attempts, typically on the part of the teacher, to "modify (by clarifying, synthesizing, or expanding)

and/or to rate (positively or negatively) what has been said previously" (Bellack *et al.* 1966, p. 4). A teacher may react to a correct answer given by a student by stating that the answer is partially correct and requires more information (i.e., reacting by modifying) or by praising the student for the correct answer (i.e., reacting by rating). A teacher may react to an incorrect answer given by a student by giving the student clues as to the correct answer or by redirecting the question to another student.

While the analytic scheme developed by Bellack and his colleagues is quite useful in examining and understanding the verbal behaviour of teachers and their verbal interactions with students, it must be remembered that teachers also communicate with their students *non-verbally*. As indicated in the earlier discussion of soliciting, teachers may use physical actions to ensure that students comply with their requests. They may pat students on their backs or hug them to indicate approval of their effort or answers. They may demonstrate for students how they are expected to solve a problem, carry out an experiment, or complete a performance.

2. *Assessing teacher-student communication*

Several instruments have been developed for the purpose of assessing the communication between teachers and students that occur within the classroom. The classic instrument for this purpose, the Flanders Interaction Analysis System (FIAS), was developed by Ned Flanders (1970). Flanders was concerned with two primary dimensions of classroom communication. First, who was speaking -- the teacher or the student? Second, was the speaker directing the conversation or reacting to what someone else was saying? When the speaker was the teacher, the question was whether the teacher was *talking to* the students (direct) or *talking with* the students (indirect). When the speaker was the student, the question was whether the student initiated the communication (direct) or responded to the teacher (indirect)? Ten categories were used in recording the communication that occurred in the classroom. When using the FIAS, the events that are observed are placed into one of these ten categories at

three-second intervals by trained observers on a standardized coding form (see *Appendix H*). (Descriptions of these coding categories are included in *Appendix I*). By summarizing the data coded, it is possible to determine the extent to which teachers or students control the communication and the extent to which the communication from teachers to students or from students to teachers is direct or indirect. More complex summarizations can be used to examine the sequence in which communication occurred (Flanders and Amidon 1981).

Rather than code the verbal interactions between teachers and students at three second intervals, it is also possible for observers to record their observations at the end of each lesson. Brophy, Evertson, and their colleagues devised a rating-scale instrument that is appropriate for such end-of-lesson coding (Brophy *et al.* 1975; Evertson and Veldman 1981). A modification of the instrument is included as *Appendix J*. Descriptions of the categories included on this revised instrument are contained in *Appendix K*. Teachers also may use this instrument as means of reflecting back over the lesson.

Finally, students (particularly older ones) may be in a better position than either observers or teachers to comment on the communication that occurs between them and their teachers. In this regard, Kennedy, Cruickshank, Bush, and Myers (1978) have suggested indicators of teacher clarity that can form the basis of a checklist given to students. A checklist based on the results of their research summary is included as *Appendix L*.

3. Recommendations for teacher effectiveness

The recommendations concerning communication between teachers and students are presented in three sections: informing and explaining, questioning, and providing feedback. These sections are similar to the structuring, soliciting, and reacting categories developed by Bellack *et al.* (1966).

Informing and explaining

(i) The information and explanations given to students by teachers should be clear and understandable.

Clarity, like beauty, lies in the mind of the beholder. In the case of teaching and learning, the beholder is the student. More will be said about this point in the following chapter. Teachers can use several techniques to increase the likelihood that the information they present and the explanations they give to students will be clear. Among the most important techniques that they can use are the following:

(a) Provide an overview of the lesson and the subject matter contained within it; help students understand the "big picture" rather than focusing on the details or minor points.
(b) When necessary, be redundant; redundancy is particularly important when difficult concepts are being taught or difficult points are being made.
(c) Avoid digressions and stick to the topic.
(d) When in doubt, check to see whether students understand as well as the extent of that understanding; classroom questions and brief assignments are useful in this regard.
(e) Include many and varied examples to illustrate major points and help students understand abstract concepts and ideas.
(f) Use verbal markers (e.g., "This is important". 'Write this down'.) to help students learn to differentiate what is important (or more important) from what is not (or less important).
(g) Use more precise, rather than less precise or more ambiguous, terms and descriptions in the explanations.
(h) Use metaphors, similes, and other types of relationships to relate the new material to what students already know.

(ii) Showing and telling, in combination, are likely to be superior to either alone.

Visual presentations allow students to process information simultaneously. That is, students can 'take in' pieces of information at the same time and contemplate ways in which they are related. As a consequence, the teaching of relational concepts pertaining to size, shape, texture, and direction is usually more effective when the presentation is visual. In contrast, verbal presentations require students to process the information sequentially. That is, students are expected to follow the sequence of the material presented one step at a time. Thus, the teaching of the logic of an argument and cause-effect relationships is often more effective when the presentation is verbal. In addition, large numbers of students benefit from presentations in multiple modalities (e.g., seeing as well as hearing). Multiple modalities tend to give students a deeper or more complete understanding of the material being learned.

Questioning

(i) Teachers should understand the two primary purposes of classroom questioning and apply questioning techniques that are appropriate to these two purposes.

Teachers tend to ask questions for two purposes: to find out whether students understand what is being presented and to stimulate students' thinking. Questions asked for the first purpose are typically referred to as 'lower-order' questions, while questions asked for the second purpose are frequently termed 'higher-order' questions.

When asking 'lower-order' questions, teachers should:

(a) ask clear, not ambiguous, questions,
(b) ensure that the questions focus students' attention on the key elements of the lesson,

(c) ask questions that permit teachers not only to check for student understanding, but to identify possible reasons for any misunderstandings that are evident, and
(d) avoid excessive use of choral responses or 'call outs', interacting with one student at a time instead.

When asking 'higher-order' questions, teachers should:

(a) allow generous amounts of "wait time" after they ask the questions (that is, the time students have to answer the questions before the teacher speaks), and
(b) remind the students, as necessary, that an answer is expected.

Whenever possible, the teacher should strive for a balance between 'lower-order' and 'higher-order' questions in their lessons.

Feedback

(i) Teachers should provide immediate feedback to students concerning the correctness or adequacy of their responses to questions.

Students should know whether they have responded correctly or incorrectly, adequately or inadequately, appropriately or inappropriately. This feedback should be clear, prompt, and accurate.

(ii) Teachers should use praise to reinforce correct, adequate, and appropriate responses made by students.

However, praise should be used sparingly and in moderation. Furthermore, students should be told why they are being praised (that is, what they did or accomplished to receive the praise). Unmerited or random praise should be avoided. When possible and appropriate, thought and effort as well as answers and products should receive praise.

(iii) When incorrect, incomplete, or no responses are given to questions by students, teachers should react in one of several potentially appropriate ways.

Although there is no single correct way for teachers to react to such responses, teachers do have a variety of potential responses from which to choose. Teachers can:

(a) 'stay with' the student, probing his or her understanding and helping him or her formulate a 'better' answer;
(b) provide clues to the student to help him or her respond in a more appropriate or correct way;
(c) redirect the question to another student in the class or, *if all else fails*;
(d) provide the answer to the student.

The reaction of the teacher depends to a large extent on his or her knowledge of the individual student and the class. If either probing (a) or prompting (b) is used as a reaction, care should be given not to allow such reactions to interfere with momentum of the lesson.

4. *Recommendations for policy-makers and educational planners*

In many respects, clear and precise communication lies at the very heart of teacher effectiveness. Effective communication requires that teachers possess a thorough knowledge of both their subject matters and their students. Good communication helps to build a bridge between students and subject matters, enabling teachers to make the subject matter understandable to their students. Poor communication can make learning even the most simple and straightforward subject matter far more difficult. In this regard, it is important to remember that the larger the educational "gap" between teachers and students, the more likely it is that poor communication will exist. Thus, Farrell's (1989) comment on the

level of education needed by primary school teachers should not be surprising:

> "It is important for teachers to have achieved a level of formal schooling at least just above that of the students they are teaching. That is, primary teachers should themselves have junior secondary; junior secondary should have a university degree. However, providing or requiring more formal education than these minima can be a very bad investment. Some poor nations provide university education for primary teachers. The payoff for this additional formal education appears to be minimal or nil". (p. 66)

Educational planners and administrators can have a positive impact on the quality of communication between teachers and students in at least two important ways. First, one of the primary criteria for selecting teachers should be communication skills. Measures of oral and written communication can be incorporated into the selection process. Rather than general measures, however, the measures should emphasize communication in relation to the teaching of some important concept or skill.

Second, the effectiveness of the communication that occurs between teachers and students should not be assumed. It must be examined and determined. In this regard, teachers can be taught to use classroom questions, exercises, and problems to check on their students' understanding of the material they were attempting to communicate to them. For these questions, exercises, and problems to provide valid information concerning the effectiveness of communication, however, they must be addressed to individual students, rather than the entire class or group. If the number of students in the classroom is too large for the understanding of all students to be systematically examined, teachers will have to choose to concentrate their questioning and problem posing on 'steering groups' (Dahllof 1971). A steering group is a small group of students (perhaps five to seven) of a known achievement level (for example, slightly below the average) that teachers can use to judge the effectiveness of their

communication. If these students demonstrate understanding, then the understanding of students at higher achievement levels can be reasonably assumed. Quite obviously, the lower the steering group, the greater the number of students whose understanding can be assumed. Quite obviously these recommendations have profound implications for teacher trainers also.

VII. Student involvement and success

Students hold the keys to their own learning. Teachers can create inviting and task-oriented classrooms (Chapters III and IV), prepare and deliver structured and efficient lessons (Chapter V), and explain the material clearly while asking appropriate questions (Chapter VI). However, teachers must acknowledge that they can neither learn for the students nor cause them to learn. Perhaps, Rothkopf (1976) made this point more forcefully when he wrote, "... the student has complete veto power over the success of ... instruction" (p. 94).

The contention that students hold the keys to their own learning is not intended to be pessimistic, nor it is intended to diminish the role of the teacher. Rather, it is to suggest that teachers must understand the critical role that students play in their own learning and use this understanding to become more 'student-oriented' (rather than 'subject-oriented' or 'self-oriented') teachers if they are to be effective in the classroom or increase their effectiveness. In this regard, Porter and Brophy (1988) assert that one of the primary traits of effective teachers is their willingness to accept responsibility for the learning of their students.

In glancing back over the previous chapters, the reader should notice a distinct student-orientation in virtually all of them. This orientation was quite clear in Chapter II in our discussion of opportunity to learn and academic work. Classroom climate (Chapter III) is not an objective reality, it is the classroom as perceived by the students. When designing classrooms, then, teachers must ask themselves questions such as "what kinds of

classrooms are more likely to be inviting to these students?" Similarly, when planning lessons (Chapter V), teachers must ask themselves questions such as "what kinds of activities are more likely to appeal to these students and engage them in the process of learning?" Finally, as mentioned at the end of the previous chapter, teachers would be wise to check with students to see what they have understood from a presentation rather than assume that their explanations are models of clarity.

1. Student involvement

The role of attention in learning has been examined by generations of scholars (Anderson 1984). More than half a century ago, Morrison (1926) asserted that "perhaps the commonest cause of non-learning is poor attention" (p. 82). Historically, two types or forms of attention have been identified: selective attention and sustained attention.

Selective attention is said to occur when the student focuses on certain features of the learning situation at the expense of others. When reading a story a student can attend to the details or the major themes. When listening to a teacher a student can attend to the examples being presented or the underlying point being made by the teacher using the examples. In contrast to selective attention, *sustained attention* requires that the students concentrate on and remain involved in the presentation being made or the assignment given to them at least until some degree of understanding has been achieved or the assignment has been completed. Traditionally, both selective and sustained attention have been believed to be necessary for students to learn what they were expected or intending to learn.

A rebirth of interest in student attention and student involvement in learning occurred in American education during the late 1960s and throughout the 1970s as a direct result of the model of school learning developed by Carroll (1963). Briefly, Carroll suggested that the degree to which students learned something depended solely on the extent to which they spent the time they needed to spend in order to learn it. Since Carroll referred to the 'something to be learned' as a learning task,

learning was said to depend on the amount of time a student spent on the task (that is, time on task) relative to the amount of time he or she needed to spend on the task in order to achieve it or learn it well (that is, time needed to learn).

The validity of Carroll's model was examined by numerous educational researchers with large amounts of empirical support being accumulated in support of the model (Carroll, 1985). Across studies, a moderate and fairly consistent relationship between time-on-task and student learning was found to exist. Nonetheless, critics suggested that an exclusive focus on time was problematic. Gage (1978, p. 75), for example, referred to time-on-task as a "psychologically empty quantitative concept". Similarly, Frymier (1981, p. 634) asserted that "learning takes more than time-on-task".

Partly in reaction to these criticisms, educators during the past decade have become far more interested in how students spend their time than in how much time they spend. Their attention has turned to answering a series of related, although more probing, questions about student involvement in learning. Examples of such questions include: What tasks are students being assigned or self-selecting? How actively or intensely involved are students in their learning? What strategies are students using in order to learn and learn well? And, perhaps most importantly from an instructional perspective, how can teachers use what is known about student involvement in learning to (1) identify appropriate objectives and activities, (2) gain and maintain active involvement on the part of students, and (3) provide strategies that students can use as they engage in the activities and work toward the accomplishment of the learning objectives? This latter question is addressed in the recommendations made at the end of this chapter.

2. *Student success*

Not only must students be involved in learning, they must experience success as they learn. The recognition of the importance of success in learning can be traced fairly directly to a single large scale study, the Beginning Teacher Evaluation Study

(BTES) (Fisher, Berliner, Filby, Marliave, Cahen, and Dishaw 1980). Simply stated, the results from the BTES indicated quite clearly that moderate to high rates of success were conducive to student learning, while low rates of success were detrimental. Unfortunately, several administrators and teachers who were interested in applying the BTES findings in their schools focused on maximizing success by minimizing the number of errors made by students. Such an application of these findings neglects two important elements concerning the concept of success.

First, success does not have to be immediately attainable. As Fisher *et al.* (1980) point out:

> "The idea of success rate is more understandable if one thinks about the cyclical nature of learning. Learning is a process of moving from not knowing to knowing. When new material is introduced the student most likely will not understand completely and will make some errors. Guided practice and/or explanation help the student understand, and she/he comes to make fewer errors. Eventually, the student will perform correctly, although probably with some effort. Learning will become well established and further work will be practice or review. ... At some later point, the student knows the material so well that further practice is of minimal value; it is time to move on to something new." (p. 17).

Thus, success is something to be achieved over time. In order to achieve success over time, however, errors must be recognized when they occur and attempts must be made to correct them. The reader should recognize this statement as an application of the concept of feedback and correction discussed in Chapter V. In summary, then, success does not mean that errors are to be *avoided*; rather, success means that errors are to be *overcome*.

Second, success may be more perceptual than real; more subjective than objective. For example, a student who makes no errors on an extremely easy assignment may experience little if any success. In contrast, a student who makes several errors on a very difficult assignment may experience a great deal of success.

Several implications can be derived from this distinction between perception and reality.

The standards that teachers use to define success for students (e.g., standards corresponding to marks of 'A' or 'B', standards indicating mastery of content or objectives) must be established on the basis of the teacher's knowledge of the learning objectives *and* the students being taught.

Furthermore, students are more likely to perceive themselves as being successful when they have to expend some effort in order to achieve the standard. Thus, the standards established by teachers must be at the same time challenging and attainable. As might be expected, setting such standards is not a easy task.

3. *Recommendations for teacher effectiveness*

Several recommendations can be given to teachers interested in involving their students in learning and increasing the success these students experience. Before accepting and implementing the recommendations pertaining to student involvement, however, it would be wise for administrators and teachers to have some knowledge of the degree to which students typically are involved in learning in their classrooms. Two instruments that can be used for this purpose are included in *Appendixes M and N*. *Appendix M* contains an observation instrument that can be used to estimate the extent to which students are on-task during different activities during the lesson. *Appendix N* contains a self-report instrument that can be completed by the students themselves. A modification of this instrument was used in a study in Thailand (Nitsaisook and Anderson 1989) with quite positive results.

(i) Teachers should set standards for success and let students know they are all *expected to meet them.*

This recommendation combines two very important issues. The establishment of meaningful (that is, important and challenging, yet attainable) standards and the communication of teachers' expectations that these standards are to be achieved by all students. In fact, this recommendation may be more important

in what it suggests avoiding. Arbitrary and capricious standards should be avoided. Standards that are impossible for students to attain should be avoided. Standards that students can attain without any effort should be avoided. Finally, differential expectations for different students or sub-groups of students should be avoided.

(ii) Students should be reinforced for paying attention and expending the effort needed to learn.

Often, students are neither encouraged to pay attention or expend effort nor rewarded for paying attention or expending effort. Simple praise for desired behaviours does wonders in many situations and for many students. Other reinforcers, such as tokens that can be exchanged for a variety of goods and services, or extra time to do what students want to do, can be used as necessary.

(iii) Students should be helped to develop strategies for learning; specifically, strategies for remembering what they have been taught and for applying what they have learned should be taught to the students.

Students are frequently told *what* they are to learn and *what* they need to know or do in order to learn. They may even be told *why* they are to learn what they are to learn. Far less often are they taught *how* to learn (Weinstein and Mayer 1986). Students can be taught rehearsal strategies (that is, actively reciting or naming what is to be learned), elaboration strategies (that is, ways of adding to or expanding on what is to be learned), organizational strategies (that is, ways of placing what is to learned into some larger framework), and monitoring strategies (that is, ways of checking on one's progress toward learning). Effective teachers should be able to provide any or all of these strategies to their students.

(iv) Teachers should create situations in the classroom that possess 'holding power'.

Situations possessing 'holding power' (a phrase coined by Kounin and Sherman 1978) enable students to remain continuously involved in learning. That is, these situations possess "holding power" over students attention and involvement. As such, these situations insulate students from outside distractions and interruptions. They also provide students with a continuous source of input concerning their learning. That is, students in these situations do not need to wait for others to provide instruction or assistance. Finally, these situations quite often involve activities in which students can make or do things. In this way, students are actively, rather than passively, involved in learning.

(v) During presentations, teachers should use techniques that keep students attentive and involved.

Several techniques are available to teachers seeking to improve their effectiveness. Teachers can ask questions and give short assignments that require their students to *think about* what is being presented rather than work it out with the aid of paper and pencil. In this regard, Nitsaisook and Anderson (1989) describe the value of using mental computation exercises in mathematics classes. Similarly, asking questions with no ready answers and questions that require students to express and defend an opinion questions typically require students to think before they respond, rather than relying on programmed, parrot-like, responses (NWREL 1990). Occasionally, teachers can question a student about a previous respond made by another student. In this way, students must be aware of what is being discussed in class and be prepared to participate in the class discussion at any time.

(vi) *During seatwork, teachers should circulate among students and monitor their work.*

This recommendations serves two purposes. First, physical proximity of teachers to students increases their attentiveness to the task at hand. Second, and more importantly, by circulating and monitoring student work, teachers can provide assistance when it is needed.

(vii) *Teachers should communicate interest and caring to students both verbally and through such non-verbal means as giving undivided attention, maintaining eye contact, smiling, and gestures.*

Often we forget that most students would do almost anything for teachers that care for them and teachers they respect. In most cases, these students would go to any lengths to gain the approval of such teachers. Obviously, teachers need to be genuine in their communication of interest and caring. If not, students will see through the charade, with the result being a diminishing of respect for the teacher.

4. *Recommendations for policy-makers and educational planners*

Much evidence suggests that involvement and success are essential to learning. Pre-service teacher education programmes should be based on a student-oriented philosophical framework. As issues concerned with teacher education are discussed with prospective teachers questions such as 'What are the consequences for students?' should guide the discussion.

In-service teacher education should include sessions on student involvement and student success. Both sessions should emphasize the recommendations for effective teachers mentioned in the previous section. Furthermore, the goal of both pre-service and in-service teacher education should be to provide teachers with a repertoire of teaching skills and strategies that can be used in different situations and with different students. Current

emphases on correct skills and strategies, if they exist, should be abandoned.

Finally, teacher guides associated with textbooks and other instructional materials should reflect a 'student-orientation'. Activities and projects that can be incorporated into various lessons should be included. Some of these activities and projects can require groups of students to work together. Methods teachers can use to stimulate curiosity and arouse interest should also be included.

The consistency with which pre-service teacher education, in-service teacher education, and teacher guides address student concerns and student roles will go a long way toward increasing teacher effectiveness.

All of the recommendations require that departments of teacher education at the national or state ministry levels ensure that the importance of student involvement and student success is included in both pre-service and in-service teacher education programs. National curriculum development centres should consider these concepts as they design teacher guides. Obviously, a strong link between the departments of teacher education and curriculum development centres would be beneficial in this regard.

VIII. How to increase teacher effectiveness

As can be seen in the previous chapters, much is known about teacher effectiveness. The problem addressed in this chapter is how to *increase* teacher effectiveness; that is, how to get teachers to *change* so they become more effective. There is little, if any, evidence that enticing teachers by, for example, paying them more money (Farrell 1989) or coercing them by, for example, making them conform to administrative mandates (Cohn and Rossmiller 1987) results in any meaningful, long lasting improvement in the quality of their teaching, at least in normal circumstances where teachers are actually paid and where they earn a salary which allows them to live. If teachers are to change the ways they teach and the ways in which they think about teaching, then their reluctance to change must be overcome and support must be provided to them as they attempt to improve.

1. Overcoming the reluctance to change

Teachers are reluctant to change for a number of reasons, most of which are quite understandable. Three of the primary reasons are (1) a lack of awareness that change is needed, (2) a lack of the knowledge and skills needed to make the change, and (3) the belief that the changes will not make any difference to them or their students.

Lack of awareness that change is needed

Some teachers see no need to change. They believe that they are doing well or, at least, the best that they can do. They see few, if any, areas in which improvements in their teaching are necessary. Such teachers, as might be expected, are not likely to change.

As a consequence, several attempts at increasing teacher effectiveness have begun by simply making teachers aware of what they currently do in their classrooms. One model of teacher improvement begins with the conduct of formal observations of the teacher in the classroom. Next, the results of these observations are summarized and discussed with the teacher. During this discussion, the observations made in the teacher's classroom are compared with those made in other teachers' classrooms, particularly those teachers who are consistently more successful or effective in their teaching. In this way, the teacher is made aware of the areas in which he or she is strong and the areas in which improvement may be needed. The teacher then develops an improvement plan which he or she implements during the next few days or weeks. Additional observations and discussions take place until the teacher is satisfied with his or her improvement (Fullan 1990).

In certain cases, simple awareness of the need for change is sufficient for substantial changes in teaching to occur. Nitsaisook and Anderson (1989), for example, report on a study conducted in Thailand in which fifty elementary mathematics teachers participated in an in-service teacher education programme lasting six days. During the programme, the teachers were made aware of the value of several classroom activities. Two of these activities were engaging students in mental computation and assigning them homework. Following training, observations were conducted in the teachers' classrooms on a monthly basis. The results indicated more than 90 per cent of the teachers engaged their students in mental computation (in contrast to less than 10 per cent of a comparison group of teachers who had not participated in the programme). Similarly, slightly more than 70 per cent of the teachers assigned homework to their students (whereas only approximately one-third of the comparison group teachers did so).

In this situation, just making teachers aware of the value of certain activities was sufficient to produce substantial changes in their teaching. However, this outstanding result can be attributed largely to the fact that neither of the activities on which substantial changes were made required a great deal of skill to implement properly.

One final comment on increasing teacher awareness seems needed before moving on: virtually all of the instruments included in the *Appendices* can be used to increase teacher awareness.

Lack of knowledge and skill to make changes

Quite obviously, there are many occasions on which simple awareness of the need to change is insufficient for change to occur. Many improvements in teaching require that teachers possess substantial amounts of knowledge, skill, or both. Increasing the clarity of the explanations of difficult or complex scientific concepts is but one of many examples of an improvement in teaching that requires great skill on the part of teachers. For most teachers, the primary sources of the knowledge and skills they need to be effective in their classrooms are (1) the education and training they received prior to becoming teachers (termed pre-service education and training), (2) the various teachers' guides or manuals that accompany curricular or instructional materials such as textbooks, and (3) the education and training they receive while on the job (termed in-service education and training).

Few formal studies of the efficacy of various types or forms of pre-service education and training have been conducted. Rather, the majority of research in this area has focused on teachers' guides or manuals and in-service education or training. However, the evidence from these studies is quite clear and reasonably consistent. Specifically, much is known about the provision of in-service education and training experiences.

In-service experiences are most effective in producing change in teachers when:

1. the knowledge and skills included are based on needs identified by the teachers themselves (Shaeffer 1986);
2. the knowledge and skills being taught to teachers are linked with what they already know and can do (Fullan 1990);
3. a variety of activities and experiences (e.g., case studies, demonstrations, videotape recordings of teachers in classrooms, discussion groups, and peer teaching) are provided to the teachers during the education or training programme (Avalos and Haddad 1981; Nitsaisook 1987);
4. teachers are participating in and learning from planned, structured activities (e.g. micro-teaching, role playing, simulations) rather than listening to 'experts' telling teachers what "they ought to know" (Avalos and Haddad 1981; Shaeffer 1986); and,
5. teachers are encouraged to apply what they have learned from their in-service experiences in their own classrooms; actually, teachers should be encouraged to "try, evaluate, modify, try again" (Fullan 1990).

In addition to these recommendations, Farrell (1989, p, 63) suggests that in developing countries a "well-designed teachers' manual accompanying a textbook set is a very effective form of in-service training for poorly trained teachers".

Farrell (1989, p.66) also reports that there is some evidence that the most cost-effective method of providing teachers in developing countries with the knowledge and skills they need to be effective in their classrooms is "a relatively brief pre-service training experience followed by the systematic provision of in-service training, especially during the early years of teaching". Examples of in-service programmes which were developed in accordance with the characteristics of effective in-service experiences mentioned earlier and which have produced measurable changes in teachers and, ultimately, in students in Indonesia and Thailand are reported in Djalil and Anderson (1989) and Nitsaisook and Anderson (1989), respectively.

The belief that change will make no difference

Some teachers believe they make little if any differences in their lives of their students. No matter what these teachers say and do, they feel they are unable to get the material across to students. Large numbers of their students consistently fail to learn, and the teachers attribute this failure primarily to characteristics of the students or their home backgrounds. It is fairly obvious to see that such teachers will resist change because they see no point in making any changes.

These teachers cannot be *told* that they do or can make a difference in their students' lives. They must be *shown* that they do. Specifically, they need to see the relationship between what they know and do and what their students learn. It is only when they see that changes in their teaching result in greater learning on the part of their students, that these teachers are likely to change their beliefs and adopt practices consistent with the desired changes in their teaching. Guskey (1986, p. 9) states this assertion in the negative: "In the absence of evidence of positive changes in students' learning, ... significant change in the beliefs and attitudes of teachers is very unlikely".

The problem, then, becomes how to get these teachers to initiate change in the first place. Several techniques have been used with varying degrees of success. The following approach, which is a compilation of these techniques, seems worthy of consideration. First, the teacher would be asked to postpone judgement on the value of the suggested changes, to avoid rejecting them out of hand; to keep an open mind and wait until the evidence has been collected to make a decision as to their usefulness. Second, the teacher would be encouraged to voluntarily participate, rather than be forced to participate, in the planned in-service experiences. If the teacher chooses to participate, additional attention should be paid to him or her and extra help should be given to him or her as necessary. If the teacher chooses not to participate, he or she should be asked to follow the progress and reactions of one or more of his or her colleagues who are participating. In this way, the teacher may be

influenced indirectly by the experiences and successes of his or her peers.

Of the three primary reasons for resisting change, the teacher's belief that he or she is incapable of making a difference in the lives of students is likely to be the most difficult to overcome. There may be other reasons hidden behind this reason. For example, a teacher may lack confidence in his or her own teaching ability. Such a teacher is, in fact, saying "Other teachers can make a difference in their students' lives, but I cannot." Once again, showing, not telling, these teachers that they can be more effective is the key to overcoming this resistance.

2. *Support for improvement efforts*

There is ample evidence that few teachers can engage in serious attempts to improve their teaching without the support of others (Huberman and Miles 1984; Guskey 1986; Hopkins 1990). Virtually all teachers who attempt to change experience some problems and set-backs early on (Huberman and Miles 1984). Without support these teachers are likely to give up and return to the *status quo*. Virtually all meaningful change requires time (Guskey, 1986; Fullan, 1990). If changes are expected in less then the time required, efforts to change will be abandoned and disappointment will reign supreme. If improvement efforts are to be successful, then, administrators, fellow teachers, or both need to provide several types of support.

Providing opportunities to benefit from mistakes

Teachers attempting to change will inevitably make mistakes. If they are reprimanded for their mistakes, they, in the future, will likely reject any changes that require them to do something new and different. Instead, they are likely to cling to their current practices with increased fervour. Administrators and fellow teachers must help teachers see that it is all right to make mistakes, provided that you learn or otherwise benefit from them. A mistake means simply that you have not yet solved the problem you are attempting to solve. And, as Fullan (1990) has pointed

out, the ability to learn by reflecting on your past actions and using insights gained from that reflection to solve problems is an important characteristic of teacher striving to become more effective.

Providing opportunities to learn from others

In most schools throughout the world, teaching is a lonely job. Teachers spend the majority of their time isolated in classrooms with their students. Contacts with other adults are minimal. If administrators enter the classroom, it is more likely to be for the purpose of judging the quality of the teaching provided by the teacher, not for the purpose of helping teachers improve their teaching (McLaughlin, Pfeifer, Swanson-Owens, and Yee 1986). Often, administrators ignore teachers' classrooms altogether.

Improvement in teaching requires that teachers have the opportunities to learn from others. As Fullan (1982) points out, it is when teachers actually try to implement a new approach to teaching that they have the most specific concerns and doubts. They need someone to turn to at this time. In this regard, Guskey (1986) suggests that teachers who have participated in in-service experiences should be provided continued support and follow-up. As examples of "continued support and follow-up" Guskey suggests that teachers be provided with "ongoing guidance and direction," "personal, hands-on, in-classroom assistance," and "opportunities to interact and share ideas with their colleagues" (p. 10). To receive this type of support, teachers must be able to share not only their successes, but their failures as well.

Treating teachers as individuals

Teachers are repeatedly told to treat their students as individuals. However, all teachers typically are given this advice in exactly the same way. That is, we consistently fail to recognize individual differences among teachers even as we admonish them to adjust their teaching to individual differences among students. Suffice it to say in this regard that the support given to an individual teacher must be appropriate to the need that teacher has for support.

Hopkins (1990), for example, suggests that a confident, risk-taking teacher may benefit from a stimulating, demanding school environment, an environment that in fact provides a minimum of psychological or emotional support. On the other hand, for a less confident, fearful teacher, the same environment may cause great anxiety and a resistance to any attempts to change. Such a teacher requires a very different school environment in which to operate if he or she is to be increasingly effective.

3. *Recommendations for policy-makers and educational planners*

There is a dilemma inherent in any attempt to increase teacher effectiveness. On the one hand, we now possess a greater knowledge than ever before of the factors that contribute to teacher effectiveness. On the other hand, we continue to struggle to find ways of helping teachers become aware of, understand, and apply this knowledge in their schools and classrooms. To state this point somewhat different, we know far more about teacher effectiveness than we do about *increasing* teacher effectiveness.

To change the *status quo* is not an easy matter and needs a concerted effort on the part of those responsible for teacher training and the running of the schools. Teachers must be made aware of what activities on their part can be most effective. This requires, in some cases, a modification to what is already in the content of the pre-service teacher training programmes. Those responsible for planning the content of such programmes should read the recommendations in each chapter of this booklet and simply check that not only are there such points in the programme but that they are also being implemented in the course of the training. Of great importance is the content of the in-service training programme. The same checking of the preceding recommendations should be conducted. It is assumed that the ministries will ensure that *all* teachers in the system attend in-service training at regular intervals. They should develop similar materials to those developed in Thailand and mentioned earlier.

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Although various types of written material to be read by teachers must be developed it is also clear that these are often a necessary but insufficient condition for change. Oral communication is important. This is achieved through the in-service teacher training courses and through inspectors' visits to schools and classrooms. This oral communication supported by written materials tends to be effective.

Mechanisms for 'listening to teachers' are important. Teachers concerns and ideas are too frequently not listened to; this is a recipe for disaster. Again, this can easily be achieved through in-service training and inspectors' visits.

Lack of materials, equipment, and skills in specific schools and teachers must be identified. This is one aspect of an information service. A second aspect of an information service is the collection of data which, when analyzed, can help in the decision-making process for the improvement of the teaching-learning process. This can include units at the ministerial and provincial level for monitoring achievement in the schools and the identification of effective and ineffective schools and classrooms. From in-depth observation of the effective and ineffective schools and classrooms information can be forthcoming about further practices of effective teachers and information on these practices can then be introduced into teacher training programmes. A number of experiments can be run to discover the most effective ways of changing the *status quo*. This type of continual searching for improvement is important and also creates a 'mental set' within the educational community for striking for improvement. These types of special information can often be carried out by specialized units in the ministry: the Educational Development Institute, the Research and Development Unit, the Examinations Unit, the Curriculum Development Unit, and the Research Unit of the Department of Teacher Education to give but a few examples.

All of this, in turn, pre-supposes that the persons at each level of the educational administration structure in a country possess the knowledge and skills to be able to understand what is required and also to have the authority and resources to do their jobs well. This, in turn, requires staff development programmes. It also

requires that those involved have clearly defined career paths within the educational administration structure.

There are many interlinking units in a ministry of education which are involved in the improvement of childrens' cognitive, affective, and social development. But, above all, it is on those units responsible for teacher training and curriculum development where the major onus falls.

Appendices

Appendix A
Opportunity to learn
(Form to be completed by teachers)

Directions for use

The purpose of this form is to find out which items on the end-of-term test are most appropriate for your students. The item numbers are listed in the first column of the form (Column 1) and the items themselves are listed in Column 2. For each item, you are to indicate in Column 3 whether, during the term, you taught or reviewed the knowledge or skill tested by the item. You are to circle 'YES' if the knowledge or skill was taught or reviewed, or 'NO' if it was not. If your response in Column 3 is YES, you are to indicate in Column 4 the degree to which you emphasized the knowledge or skill tested by the item. You are to circle either much emphasis (ME), some emphasis (SE), or little emphasis (LE). If your response in Column 3 is 'NO', you are to indicate in Column 5 the primary reason the knowledge or skill tested by the item was neither taught nor reviewed during the term. You are to circle A if the knowledge or skill had been taught prior to this term, B if it will be taught sometime after this term, C if it is not in the school curriculum at all, or D if there was some other reason.

Directions for scoring

The completed form can be scored in several ways. The simplest way to score it is to count the number of 'YES' responses in Column 3 and convert the count to a percentage of total items. The higher the percentage, the greater the OTL. A somewhat more complicated scoring procedure involves Column 3 and Column 4. Each 'NO' response in Column 3 is given 1 point. Each 'LE' response in Column 4 is given 2 points. Each 'SE' response in Column 4 is given 3 points. Each 'ME'

response in Column 4 is given 4 points. The points given to each item are then summed to produce a total. Again, the higher the total, the greater the OTL. A third way of scoring the completed form involves combining Column 3 and Column 5. In this scoring procedure, a 'yes' response in Column 3 is worth 3 points. An 'A' response in Column 5 is worth 2 points. Any other response in Column 5 (e.g., B, C, D) is worth 1 point. Again, a total score is computed, with higher total scores indicating greater OTL.

Column 1	Column 2	Column 3	Column 4	Column 5
1		YES NO	ME SE LE	A B C D
2		YES NO	ME SE LE	A B C D
3		YES NO	ME SE LE	A B C D
4		YES NO	ME SE LE	A B C D
5		YES NO	ME SE LE	A B C D
6		YES NO	ME SE LE	A B C D
7		YES NO	ME SE LE	A B C D
8		YES NO	ME SE LE	A B C D
9		YES NO	ME SE LE	A B C D
10		YES NO	ME SE LE	A B C D
11		YES NO	ME SE LE	A B C D
12		YES NO	ME SE LE	A B C D
13		YES NO	ME SE LE	A B C D
14		YES NO	ME SE LE	A B C D
15		YES NO	ME SE LE	A B C D
16		YES NO	ME SE LE	A B C D
17		YES NO	ME SE LE	A B C D
18		YES NO	ME SE LE	A B C D
19		YES NO	ME SE LE	A B C D
20		YES NO	ME SE LE	A B C D

Note: The items themselves would be written in Column 2

Appendix B

Academic work checklist

Directions: Select a piece of academic work assigned to students in a class. Analyze the work in terms of the following seven questions. The greater the number of 'no' and 'not sure' responses, the lower the quality of the assigned work. Relevant comments pertaining to each question can be made at the bottom of this checklist or on the reverse side.

1.	Is the learning goal or objective to which the work is related clearly understood by the students? That is, do students know what they are to learn by completing the work?	YES	NO	NOT SURE
2.	Will completion of the work likely result in students accomplishing the intended purpose?	YES	NO	NOT SURE
3.	Is the assigned work presented in an organized manner that enhances student completion of it in a way that facilitates desired learning?	YES	NO	NOT SURE
4.	Are directions for completing the work clearly stated, preferably in writing? That is, do students know how they are to complete the work?	YES	NO	NOT SURE
5.	Are the criteria and standards used to judge the quality of the work explicit and clear? That is, do students know how their work is to be evaluated?	YES	NO	NOT SURE

6.	Is the length of the work reasonable in view of the intended purpose and allocated time?	YES	NO	NOT SURE
7.	Is the type or format of the work familiar to the students?	YES	NO	NOT SURE

COMMENTS:

Appendix C

Rating scales for classroom environment and climate

Directions: At the end of the lesson, take a few minutes to rate each scale in terms of its presence in the classroom. If, for example, all materials needed by the students were ready for them, the rating for scale number 3 should be a '5'. If, on the other hand, none of the materials needed by the students were ready for them, the rating for scale number 3 should be a '1'. The remaining three numbers ('2,' '3', and '4') represent varying degrees of 'readiness'.

Scale Label		Ratings (1 = low, 5 = high)				
1.	Degree of visibility.	1	2	3	4	5
2.	Suitable traffic patterns.	1	2	3	4	5
3.	Materials are ready.	1	2	3	4	5
4.	Conveys value of curriculum.	1	2	3	4	5
5.	Students are task oriented.	1	2	3	4	5
6.	Consistently enforces work standards.	1	2	3	4	5
7.	Relaxed, pleasant atmosphere.	1	2	3	4	5
8.	Teacher listens to students.	1	2	3	4	5

Source: Emmer, E.T., Sanford, J.P., Clements, B.S., and Martin, J. (1982). *Improving classroom management and organization in junior high schools: An experimental investigation.* Austin, Texas: Research and Development Center for Teacher Education, University of Texas.

Appendix D

Descriptions of rating scales for classroom environment and climate

Scale number and name	Description of rating
1. Degree of visibility.	Students' desks, chairs, and work areas, and any area in which the teacher spends much time e.g. teacher's desk, audio-visual equipment) are placed so that a clear line of sight is available. Rate a 5 if the teacher can see all students and the students can see the teacher and relevant instructional displays. Rate a 1 if the degree of visibility is minimal.
2. Suitable traffic patterns.	The teacher and students are able to move around the room easily, without interrupting each other's work. Lanes to the doorway, pencil sharpener, and major work areas are open. Needed materials and supplies are accessible. The teacher can get to each student for private contact. Rate a 5 if all elements are present in the classroom; rate a 1 if no elements are present.
3. Materials are ready.	Rate a 5 if all materials and equipment are ready for use on all occasions. Rate a 1 if materials are a significant source of problems (e.g. the teacher continuously runs out of materials, spends a lot of time hunting for them and/or getting them into pupil hands, provides written materials that are illegible, has equipment that cannot be used because bulbs, batteries, or extension cords are missing).

4.	Conveys value of curriculum.	Rate a 5 if teacher emphasizes the value, usefulness, importance of knowledge and skills included in the curriculum, and conveys interest and/or excitement in learning in the curriculum. Rate a 1 if all above elements are missing.
5.	Students are task oriented.	Task orientation of students refers to the extent to which students appear to accept the importance of or necessity for doing assigned work. Rate a 5 if students support and demonstrate enthusiasm for activities and assignments, and seem eager to participate. Rate a 3 if students appear to be accepting and willing, but not enthusiastic. Rate a 1 if students show resistance, complain, and/or avoid engaging in assigned tasks.
6.	Consistently enforces work standards.	The teacher's expectations for work quality of student work, with respect to both effort and performance, are clearly conveyed to and understood by the students. Rate a 5 if all students are expected to work up to their capacity and the teacher does not give up on or expect lower quality work from some students. Rate a 1 if poor quality work is accepted and/or deadlines for completing work are ignored or routinely extended.
7.	Relaxed, pleasant atmosphere.	Rate a 5 if the teacher and student seem to get along nicely. There is an absence of friction, tension, or antagonism; behaviour is friendly and courteous. The teacher and students obviously like each other. Students like and/or respect one another. Rate a 1 if all elements are missing.

8.	Teachers listen to their students.	This component refers to the reactions of the teacher when a student (or group of students) is talking. Rate a 5 if the teacher exhibits listening behaviours that communicate attention, acceptance, and encouragement. Such behaviours include eye contact; appropriate verbal statements or questions ('Can you tell me more?" or 'You seem upset'); gestures (nodding) or physical orientation to the student; and appropriate silence (not interrupting or cutting off the student). Rate a 1 if the teacher exhibits behaviours that discourage student talk or denigrates the student.

Appendix E

Rating scales for classroom organization and management

Directions: At the end of the lesson, take a few minutes to rate each scale in terms of its presence in the classroom. If, for example, the administrative routines used by the teacher were quite efficient (that is, they were well organized and required very little time to complete), the rating on scale 1 should be a '5'. If, on the other hand, the administrative routines were time consuming to the point that they interfered with learning, the rating on scale 1 should be a '1'. The remaining three numbers ('2', '3', and '4') represent varying degrees of efficiency.

Scale Label	Ratings (l=low, 5=high)				
1. Efficient administrative routines.	1	2	3	4	5
2. Appropriate classroom procedures.	1	2	3	4	5
3. Efficient opening/closing routines.	1	2	3	4	5
4. Appropriate pacing of lesson.	1	2	3	4	5
5. Efficient small group procedures.	1	2	3	4	5
6. Manages interruptions.	1	2	3	4	5
7. Consistently manages behaviour.	1	2	3	4	5
8. Stops misbehaviour promptly.	1	2	3	4	5

Source: Emmer, E. T., Sanford, J. P., Clements, B. S., and Martin, J. (1982). *Improving classroom management and organization in junior high schools: An experimental investigation.* Austin, Texas: Research and development Center for Teacher Education, University of Texas.

Appendix F

Descriptions of rating scales for classroom organization and management

Scale number and name	Description of rating
1. Efficient administrative routines.	These routines include attendance checks, record keeping, and maintenance of files. Rate a 5 if the teacher has routines which minimize administrative intrusion into instructional time. Rate a 1 if much time is lost to administrative matters.
2. Appropriate classroom procedures.	Classroom procedures include those for entering and leaving the room, using equipment and materials, moving around the room, handing in assigned work, and receiving permission to talk or ask questions (e.g. hands raised) and handing in assigned work. Rate a 5 only if adequate procedures are present for all aforementioned elements. Rate a 3 if inefficient or poor procedures are evident for a few key elements. Rate a 1 if many elements have no procedures or the procedures are not appropriate (that is, do not work, cause confusion or lost time).

3.	Efficient opening and closing routines	The class follows established closing routines for beginning and ending the lesson or class period in an orderly manner. Examples of opening and closing routines are short academic review activities (warmups), recording the day's assignments, making announcements, straightening desks and tables, returning equipment and supplies, and tidying up the room. Rate a 5 if opening and closing routines are well established and the beginning and end of the class period proceed smoothly and efficiently. Rate a 1 if no opening and closing routines are apparent (that is, the period begins and ends with confusion or wasted time).
4.	Appropriate pacing of lessons.	Activities within a lesson proceed neither too quickly nor too slowly for most of the students in the class. Rate a 5 if the lesson proceeds without frequent interruptions, false starts, or backtracking, and if the teacher avoids spending too much time on one aspect of the lesson and hurrying through the rest. Rate a 1 if the pacing is overly fast or slow.

5. Efficient small group procedures.	Rate a 5 if assignments for each group within the classroom are clear and appropriate, needed equipment and materials are available, and procedures have been established for students outside the group with which the teacher is working to get help or assistance. Rate a 1 if all three elements (assignments, equipment/materials and help/assistance) are missing. If small groups are not formed, omit this rating scale.
6. Manages interruptions.	An interruption is an event that intrudes into the classroom environment and distracts the class and/or teacher. Interruptions include visitors, late-arriving students, and loud noises. When one or more interruptions occur, rate a 5 if the teacher handles the interruption so as to minimize its interference with instruction (that is, students are well behaved, continue with their work, and wait quietly for the interruption to end). Rate a 1 if the interruption severely disrupts the flow of instruction. If no interruptions occur, omit this scale.

7.	Consistency in managing behaviour.	Rate a 5 if the teacher is highly consistent in her responses to appropriate and inappropriate behaviour for different students and at different times. Rate a 1 if the teacher is very inconsistent in her responses. For example, the teacher allows a certain behaviour on one occasion and disapproves of it on another. Or, the teacher frequently allows deviations from stated rules or established procedures or routines.
8.	Stops misbehaviour promptly.	If misbehaviour occurs, rate 5 if the behaviour is terminated without involving additional students or without continuous interruption to the activities in the lesson. There is rapid return to normality. Rate 1 if the misbehaviour spreads to the entire class and much instructional time is lost. If no misbehaviour occurs, omit this rating scale.

Appendix G

Teacher checklist for stages of lesson (adapted from Good and Grouws, 1979)

Directions: Reflect back on the past several weeks of teaching and respond to the following statements. The majority of the statements require you to consider how often, on the average, you engage in particular activities. The final question asks you to indicate whether you do or do not engage in the activity.

1. I make sure that students are aware of the purpose, goal(s), or objective(s) of the lesson, and have some level of understanding of the necessity or importance of the lesson in the larger scheme of things.

   _____ 4 or 5 times a week
   _____ 3 times a week
   _____ once or twice a week
   _____ rarely if ever

2. At the beginning of the lesson I conduct a brief review of the knowledge and skills included in previous lessons that are associated with or necessary for learning the knowledge and skills taught in the lesson.

   _____ 4 or 5 times a week
   _____ 3 times a week
   _____ once or twice a week
   _____ rarely if ever

3. I pose questions, problems, or puzzles that students must work out in their heads (that is, without the aid of books, paper, and pencils) at the beginning of the lesson and throughout the lesson as appropriate.

_____ 4 or 5 times a week
_____ 3 times a week
_____ once or twice a week
_____ rarely if ever

4a. When engaged in whole class instruction, I spend a substantial portion of the lesson (at least one-third) presenting to or discussions with the students the key facts, concepts, and skills related to the purpose, goal(s), or objective(s) of the lesson.

_____ 4 or 5 times a week
_____ 3 times a week
_____ once or twice a week
_____ rarely if ever

4b. When co-operative learning is operating in my classroom, I make certain that students have been taught how to work co-operatively, have been given assignments that require them to work co-operatively, and understand the need to be responsible for the group and accountable for individual progress.

_____ 4 or 5 times a week
_____ 3 times a week
_____ once or twice a week
_____ rarely if ever

5. During presentations, I use examples to help students understand abstract concepts or ideas, and I use demonstrations to show students how to perform skills or apply their knowledge.

_____ 4 or 5 times a week
_____ 3 times a week
_____ once or twice a week
_____ rarely if ever

6. I provide opportunities for students to work with their new knowledge or practice their newly acquired skills under my supervision (or the supervision of their peers) before I allow them to work or practice on their own.

_____ 4 or 5 times a week
_____ 3 times a week
_____ once or twice a week
_____ rarely if ever

7. I provide opportunities for students to work with their new knowledge or practice their newly acquired skills on their own either in the classroom or at home.

_____ 4 or 5 times a week
_____ 3 times a week
_____ once or twice a week
_____ rarely if ever

8. I periodically conduct lessons which review large amounts of previously taught knowledge and skills (e.g., those taught during an entire unit or term).

_____ yes
_____ no

Appendix H

Coding form for Flanders Interaction Analysis System (FIAS)

Directions: Every three seconds code what was seen and heard into one and only one of the ten categories included on the form. Indicate your coding by marking a check mark in the appropriate place on the form. For example, if during the first 3-second interval, the teacher gave directions to the students, a check mark would be placed in the cell as indicated on the form.

Teachers talk *Indirect*	Seconds 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60
Accepts feeling	
Praises or encourages	
Accepts or uses students' ideas	
Asks questions	
Direct	
Lectures	
Gives directions	
Criticises or justifies authority	
Student talk	
Response	
Initiation	
Silence, confusion or uncodeable	
	3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60

Appendix I

Descriptions of categories on the FIAS

Teacher talk

Response

1. *Accepts feeling.* Accepts and clarifies an attitude or the feeling tone of a pupil in a non-threatening manner. Feelings may be positive or negative. Predicting and recalling feeling are included.

2. *Praises or encourages.* Praises or encourages pupil action or behaviour. Jokes that release tension, but not at the expense of another individual; nodding head, or saying 'Um hm?' or 'go on' are included.

3. *Accepts or uses ideas of pupils.* Clarifying, building or developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but as the teacher brings more of his own ideas into play, shift to category five.

4. *Asks questions.* Asking a question about content or procedure, based on teacher ideas, with the intent that a pupil will answer.

Initiation

5. *Lecturing.* Giving facts or opinions about content or procedures, expressing his own ideas, giving his own explanation, or citing an authority other than a pupil.

6. *Giving directions.* Directions, commands, or orders to which a pupil is expected to comply.

7. *Criticizing or justifying authority.* Statements intended to change pupil behaviour from non-acceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.

Pupil talk

Response

8. *Pupil talk - response.* Talk by pupils in response to teacher. Teacher initiates the contact or solicits pupil statement or structures the situation. Freedom to express own ideas is limited.

Initiation

9. *Pupil talk - initiation.* Talk by pupils which they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought, like asking thoughtful questions; going beyond the existing structure.

Silence

10. *Silence or confusion.* Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

* There is no scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event.

Appendix J

Classroom observation scale (revised)

Directions: At the end of the lesson or observation period, take a few moments to indicate the frequency with which each of the following events were observed. Circle a '1' if the event occurred rarely if ever. Circle a '5' if the event occurred very frequently. Circle the numbers in between (that is, '2', '3', or '4') to indicate gradations in the frequency of occurrence.

Event		Rating				
1.	Teacher presentation	1	2	3	4	5
2.	Clarity of presentation	1	2	3	4	5
3.	Teacher enthusiasm	1	2	3	4	5
4.	Teacher questioning	1	2	3	4	5
5.	Rote memory or fact questions	1	2	3	4	5
6.	High level or why questions	1	2	3	4	5
7.	Personal opinion questions	1	2	3	4	5
8.	Teacher academic feedback	1	2	3	4	5
9.	Teacher probes, prompts, and redirects	1	2	3	4	5
10.	Pupil-to-pupil academic interaction	1	2	3	4	5

Source: Adapted from Brophy, Coulter, Crawford, Evertson, and King (1975) and Evertson and Veldman (1981).

Appendix K

Description of categories on the classroom observation scale (Revised)

Category	Description
1. Teacher presentation	1. Frequency with which the teacher presented information to the entire class of students; lecturing, reading to the class, and answering student questions are examples.
2. Clarity of presentation	2. Frequency with which the teacher's presentation of material and his/her substantive interactions with students appeared to be understood by them.
3. Teacher enthusiasm	3. Frequency with which the teacher displayed interest, involvement, and vitality in the subject matter or activity using verbal or non-verbal communication.
4. Teacher questioning	4. Frequency with which the teacher asked questions or posed problems to individual students while teaching to the whole class.
5. Rote memory or fact questions	5. Frequency with which the teacher asked questions to which students were to supply brief factual answers or to respond from rote memory.
6. High level or why questions	6. Frequency with which the teacher asked questions or posed problems which required reasoning, inference, integration of material, or abstract thinking.

7.	Personal opinion questions	7. Frequency with which the teacher asked questions or posed problems to which students were to express and/or defend an opinion.
8.	Teacher academic feedback	8. Frequency with which the teacher reacted to students' answers to questions by promptly indicating the correctness or adequacy of the answers.
9.	Teacher probes, prompts, and redirects	9. Frequency with which the teacher reacted to students' incorrect, partially correct, or inadequate answers to questions by asking additional related questions, giving clues as to the proper answer, or asking another student the same question.
10.	Pupil-to-pupil academic interaction	10. Frequency with which students talk with other students, singly or collectively, about academic matters; this talk may occur in indirect response to the teacher or as part of a discussion or assignment involving only students.

Appendix L
The clear teacher checklist

Directions to students: As your teacher I hope I explain things clearly but I may not always do so. In order to improve my ability to be clear I need your help. Read each statement below and place a check mark in the column that tells how often I perform the behaviour that is described. In that way I will know what I do well and where I need to improve.

Put a check mark in a column after each statement.

As our teacher, you:	Always	Most times	Sometimes	Never	Does not apply
1. Give explanations we understand.					
2. Teach teaching step-by-step.					
3. Describe the work to be done and how to do it.					
4. Explain something and then work an example.					
5. Explain something and then stop so we can ask questions.					
6. Give us a chance to think about what is being taught.					
7. Emphasize difficult points.					
8. Answer our questions.					
9. Ask questions to find out if we understand.					
10. Show us the differences between things.					

Source: Adapted from Kennedy, Cruickshank, Bush, and Myers (1978).

Appendix M
The Individual Activity Record (IAR)

Direction: Observers using the IAR have three primary tasks to perform. The first task is the selection of eight students to be observed during the observation session. To the extent possible, these students should be selected to represent the diversity of the students in the classroom. In the space beside each student's number, the observer can note characteristics of the student (e.g., where the student is sitting, what the student is wearing, whether the student is a boy or a girl, or tall or short) that will help the observer remember each student.

The second task is to observe all eight identified students on five separate occasions during the observation period. On the IAR these occasions are labelled Time 1, Time 2, Time 3, Time 4, and Time 5. The occasions should be selected so as to represent a good cross section of the observational period (e.g., beginning, middle, and end). During each occasion, student number 1 is observed for approximately ten (10) seconds, then student number 2 is observed for approximately ten seconds, and so on.

The third task is to record what is seen and heard as each student is being observed. Specifically, the observer is expected to note (1) the activity in which the student is participating or is expected to participate, (2) whether or not the student was engaged in the activity, and (3) the relationship between the teacher and the student. The codes for activity (A), engagement (E), and relationship (R) are listed at the bottom of the IAR.

The numbers corresponding with these activity, engagement, and relationship codes are placed in the columns headed by A, E, and R, respectively, for each of the five time periods. If, during the first time period, for example, the first student was paying attention while the teacher was explaining something to the class, the code for Time 1 for this student would be 01 in the A column [listening to lecture/explanation/recitation/demonstration], 1 in the E column [engaged in learning], and 1 in the R column [teacher interacting with students]. If, during the fifth time period, this same student was staring off into space while his classmates were reading silently at their seats and the teacher was talking to a visitor who had entered the room, the code for Time 5 for this student would be 06 in the A column [seatwork - reading silently], 0 in the E column [not engaged in learning], and a 3 in the R column [teacher uninvolved with students].

Observer name _____

Teacher_____ School_____

Observation Session No._____

Student I.D.	Time 1	Time 2	Time 3	Time 4	Time 5
	A E R	A E R	A E R	A E R	A E R
No. 1					
No. 2					
No. 3					
No. 4					
No. 5					
No. 6					
No. 7					
No. 8					

A:01 Listening to lecture/explanation/recitation/demonstration
A:02 Reviewing previous content
A:03 Participating in discussion/discourse
A:04 Participating in oral practice/drill
A:05 Seatwork - taking a test
monitoring/observing
A:06 Seatwork - reading silently
A:07 Seatwork - written assignments
A:08 Seatwork - laboratory/manipulative
A:09 Non-academic management (transition/procedural/social/discipline

E:1 Engaged
E:0 Non-engaged

R:1 Teacher interacting
R:2 Teacher
R:3 Teacher uninvolved

Appendix N

The student involvement checklist

Directions. Read each statement below, thinking back over today's lesson. If you agree that the statement expresses something that *you* thought or did during the lesson, circle 'YES'. If you believe that the statement does not, circle 'NO'.

1.	I was able to separate the important points from the details.	YES	NO
2.	I had trouble understanding what was being talked about in class.	YES	NO
3.	I disagreed with something the teacher said or an answer to a question given by another student.	YES	NO
4.	I gave up on a question or problem that was just too difficult.	YES	NO
5.	I think I could explain what I learned today to other students.	YES	NO
6.	I was reluctant to ask for help even though I needed it.	YES	NO
7.	I paid attention almost all of the time.	YES	NO
8.	During class my mind often wandered and I thought of other things	YES	NO
9.	I thought about how what I was learning was related to things I already knew.	YES	NO
10.	I rarely thought about things I did not understand.	YES	NO

Note on scoring: For even numbered statements, YES responses are worth 1 point, while NO responses are worth 0 points. For odd numbered statements, NO responses are worth 1 point, while YES responses are worth 0 points. The total number of points should be computed, and the higher the number the greater the involvement of student.

Source: Adapted from Hecht (1978).

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The booklet

There are several ways in which the quality of an education system can be improved. Whatever is done in terms of distributing new material or developing new curriculum, however, the quality of education that students receive will always be highly dependent on the quality of instruction that teachers provide. In other words educational effectiveness depends first and foremost on teachers effectiveness.

The present booklet addresses the important issue of how teachers and the schools in which they work can be made increasingly effective. It summarizes a wealth of research results available on the subject in developed, but also developing countries. It also provides instruments for researchers, or those responsible for the planning of teaching in one country, who would like to study what really happens in the classrooms in which students receive their instruction.

The author

Lorin W. Anderson is currently a Carolina Research Professor at the University of South Carolina USA. He has conducted research and written extensively on the productive use of classroom time, learning for mastery, and educational programmes for economically disadvantaged children. His most recent books are *The IEA classroom environment study*, which he co-edited with Doris W. Ryan and Bernard J. Shapiro, and *Research in classrooms: the study of teachers, teaching, and instruction*, which he co-authored with Robert B. Burns. He is section editor for teacher education for the forthcoming International Encyclopaedia of Education.

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